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FILMSTRIPS

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# FILMSTRIPS

A DESCRIPTIVE INDEX  
AND USERS' GUIDE

by VERA M. FALCONER

CONSULTANT ON MOTION PICTURES AND FILMSTRIPS

FIRST EDITION

NEW YORK TORONTO LONDON  
McGRAW-HILL BOOK COMPANY, INC.

1948



# FILMSTRIPS

A DESCRIPTIVE INDEX

AND USERS' GUIDE

## FILMSTRIPS

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TO HAROLD GRIFFIN







# Preface

This book was prepared at the suggestion of teachers, school administrators, and others interested in the effective dissemination of ideas. The main object is to provide a complete description of all filmstrips suitable for instructional use, which were available on or before March 15, 1947. Each filmstrip listed has been personally reviewed, frame-by-frame, by the author, and while some strips may possibly have been overlooked, this is the result of a 12-year search for filmstrips and their sources.

Every effort has been made to make this book so simple to use that no key or code will be necessary. The mechanics of satisfactory exhibition are described, and the practical aspects of school filmstrip production are presented. Suggestions for filmstrip use are summarized. The general chapters provide background information for those who are inexperienced with the filmstrip medium, while the alphabetical listing under appropriate subject-matter sections is useful for those who have used filmstrips extensively.

Each filmstrip listing includes the name of the distributor, technical data, and information concerning manuals and teachers' guides or lecture notes where available. A complete Distributor Directory is included at the end of the book. The table of contents will enable most users to locate the information they need, since cross-referencing is provided at the end of each subject-matter listing, but there is also an alphabetical title index.

If the reader is looking for a new philosophy of education, a short cut, or a solution to the teacher shortage, he will be disappointed, although the retention of information by the student is undoubtedly enhanced by the use of pictures that visualize the concepts being presented. Motion pictures are more glamorous than filmstrips, but much more expensive. A still-picture file can present the same material as filmstrips but is more difficult to use and usually consumes more time in both teacher preparation and classroom use. If an opaque projector is used, the equipment investment is greater and its operation more cumbersome. Standard slides can also present still pictures effectively, but the projector is more expensive, and the cost per single picture of the professionally made  $3\frac{1}{4}$  by 4 glass slide is usually between ten and fifty times as much as that of a filmstrip frame.

The only other alternatives in static illustration are teacher- or student-made slides (both 2 by 2 and  $3\frac{1}{4}$  by 4), posters, wall maps, charts, and standard black-board illustration. Desirable as these possibilities are, their use can be made more effective by integrating them with filmstrip-presented visual ideas. In the case of



blackboard drawing, the busy teacher can save much time by using filmstrip drawings to trace diagrams otherwise difficult or time-consuming. Teacher-made filmstrips can include much of the material presented previously in a more laborious way without diminishing the effectiveness of presentation.

Any classroom teacher, group leader, or individual can project filmstrips properly. Mechanical details can and should be delegated to a member of the class or group. Although the emphasis on the use of visual aids was originally placed on lightening the teacher's load, the pendulum has swung in recent years and it sometimes seems more difficult to teach with some visual aids than without them. Fortunately, this is not the case with filmstrips. Of course, effective utilization develops with practice, but it is hoped that any reader of this book will see that no special training is needed to use filmstrips well.

VERA M. FALCONER

NEW YORK, N. Y.

*February, 1948*



# Acknowledgments

Individual acknowledgments for all the assistance received in the preparation of this type of book are impossible due to the fact that most of the material in it was obtained either directly or indirectly from some outside source. However, it is necessary to point out to the reader that the book would not have been possible without the specific assistance referred to here.

One of the biggest debts is to my elementary and high school students who for more than 7 years reacted with varying degrees of interest to the filmstrips and other visual aids used in my courses. This information received from my own students would have been of limited value without the cooperation of my colleagues and administrators in public schools and the faculty members of Dartmouth College who shared with me their experiences with visual aids.

The foregoing field experience would not in itself have enabled me to undertake this task. In fact, without the very special opportunities provided in the United States Armed Forces Institute Visual Aids Department wartime program, under the direction of Col. Francis T. Spaulding, I would not have had sufficient background in the use of mass media in education to tackle this assignment. The sympathetic understanding of Lt. Col. Herbert G. Espy and his assistance in integrating educational requirements with the Army system were invaluable prerequisites to the development of the ideas included in this book. The day-to-day encouragement of and discussions with Maj. John C. Rose gave me the confidence necessary for correlating all the material previously gathered and for reviewing, frame-by-frame, more than three thousand filmstrips.

A most important criticism of any visual aid must be made against a background of information concerning visual possibilities inherent in the subject matter. An inevitable dilemma is created by the fact that many academic authorities think in abstract rather than in visual terms while at the same time most creative people in the visual arts are not familiar with pedagogical problems. Therefore, a very special debt of gratitude is due the various artists who have helped me to learn to think in visual terms. Specific acknowledgment is made to the following: Abner Dean, Will Downs, Jack Levine, Charles Mack, Charles McCurdy, Shelley Moldoff, Bob Moore, and Paul Sample.

Space does not permit specific acknowledgment to individuals in distributing and producing companies who provided screening prints, information, and courteous assistance. Persons in each of the companies listed in the Distributor Directory



were exceptionally helpful and generous with their time. The sources of illustrations, credited individually beneath each picture, gave a considerable amount of their time to supply the requested illustrations. Their assistance is much appreciated. The special drawings prepared for this book under the sponsorship of the Da-Lite Screen Company by York Studios were particularly welcome, as were the cartoons drawn by Frank Pagan.

Of course, the constant encouragement and patience of my husband during the preparation of the manuscript helped immeasurably.

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# What Are Filmstrips?

Filmstrips are frequently called by other names. Just as some motion-picture people do not like the use of the word "movie," some producers in this field feel that the term "filmstrip" lacks dignity. However, for want of a better term, the word "filmstrip" is in more common usage than the various substitutes that refer to still pictures printed in sequence on a strip of film.

A description of the physical properties of filmstrips (given later) is relatively unimportant compared with the need for a definition of filmstrips as a distinct medium of communication. Such a definition is not yet permitted, except as an objective, by the present development of the field. Ideally, the filmstrip as a unique medium requires a treatment of its own for greatest effectiveness. It cannot be a textbook chapter "adapted" for slide-lecture projection, or a motion-picture sequence with the motion removed, or a magazine or newspaper article presented on film. Its potentialities and characteristics point to its production treatment not as a different version of other media, but as a filmstrip.

Any creative individual, who takes time to consider the great opportunities inherent in a picture sequence integrated with effective subtitling, realizes instinctively the unmet challenge of the filmstrip. It is important for the user, too, to pause a moment before selecting filmstrips to consider the special attributes of the filmstrip. The user should do more than recognize that the filmstrip provides the simplest, most direct, and least expensive mass medium of communication yet invented. We do not mean that the user should be concerned with the technology of laboratory operations for reproducing 35-mm nonflammable filmstrips, which is almost as far removed from the teacher's concern as the operation of a linotype is from the author's. But a consideration of the potentialities and attributes of this opportunity for communication made possible by the development of the photographic industry in the light of previous picture uses may help the newcomers to the filmstrip field to save time in selecting, using, and producing filmstrips. A brief history of filmstrip development is provided here as a reminder that the idea of telling stories in still-picture sequences has grown and matured through the ages and is not merely a new use for a by-product of motion-picture-film manufacture.

From the days of Cro-Magnon drawings, the picture has been a part of man's communication. In addition to the drawings still preserved in caves and in the remains of early civilizations uncovered by archaeologists, there is substantial



evidence that drawings in the sand were used long before any alphabet was invented. Centuries ago the Greeks used objects and drawings in instruction. With the advent of photography in the last century, the possibilities of this medium expanded, just as the possibilities of the word in communication expanded with the invention of printing a number of centuries earlier. The use of photographic reproduction is being accepted much more rapidly than the use of the printed word was during its early years. The projected picture introduced by the magic lantern held promise of usefulness in education, and developments brought the opaque projector and the standard  $3\frac{1}{4}$ - by 4-in. glass slide early in the century. These developments made possible the accomplishment of the following objectives: (1) The same drawings and other materials could be used year in and year out, thus relieving the teacher of the drudgery of redrawing intricate materials on the blackboard for each new class; (2) material made by both teacher and pupils could be used; (3) the personality and teaching ability of the teacher were enhanced rather than subordinated by the use of such visual devices; (4) the use of still pictures projected individually allowed ample time for discussions of each picture; (5) the teacher now had for the first time a much more unlimited range of pictures and other matter from which to choose; (6) the common experience provided by the simultaneous viewing of pictures previously available only in the printed form gave the group a supplement for the individual study of each student.

The projection simplification that we now know as the filmstrip came into being shortly before 1920 when Underwoods of New York conceived the idea of putting their large photographic library on 55-mm film. In a sense the step was comparable to the introduction of Eastman roll film in photography. These new materials were mainly photographs of people and places with brief identifying captions. The activity was taken over by the Stillfilm Company for distribution to schools as a substitute for the glass slide, with a "teaching" title for each picture as an added attraction. Later 35-mm film was found more desirable and became the standard width for the filmstrip. This type of pictorial teaching aid continued to gain popularity until the early 1930's and the development of the educational sound motion picture. For a time, school interest was captured almost completely by sound movies; however, in recent years the filmstrip is again coming into popularity—not to the exclusion of other visual devices, but where it has most to contribute. Teachers are becoming more and more alert in their selection of visual aids, becoming shrewder buyers in getting utmost teaching value out of visual education budgets; particularly in those subject matter areas, over 90 per cent of all subject matter taught in schools, where motion is not essential to adequate presentation.

As pointed out by J. Y. Taylor in the manual "Opaque Projection":<sup>1</sup>

The teaching program today differs in many respects from that of a few years ago. Now, teachers recognize the importance of a child's readiness for any new skill or activity. If he is not prepared through experience or maturity for his new learning problems, little or no result can be expected. Good teaching recognizes this basic fact and sets itself to prepare the pupil for each progressive step in his learning. This preparation for progress is as necessary at the high school level as at the primary stage.

In present-day schools the teacher has become a guide in child learning. The greatest problem is not to think for the children, but to plan circumstances that arouse mental activity on the part of the pupils. Everything possible is done to stimulate the natural learning assets and through proper motivation, to minimize conscious effort and capitalize on spontaneous attention.

In accomplishing these aims and in bringing about a closer relationship between the child's practical experience and his school experience, Visual Teaching is finding its rightful place in the modern school. . . . The use of these aids (mechanical aids such as the many varieties of projectors) unleashes the tremendous force of spontaneous attention which is basic to easy, natural learning.

A sequence of still pictures can combine the dramatic stimulation of the motion picture with the academic integrity of the carefully prepared instructional diagram, painting, or photograph. Even though the theater, motion pictures, and other media depending on a time element for presentation have achieved great artistic triumphs, the message carried in these media is never as direct as that preserved in its original, complete visual form—as in painting, sculpture, photographs, and architectural construction. Music and other arts require more from the audience than can be expected from the average student previously unprepared for the appreciation of the art impression. However, pictures have been able to carry a message through the centuries that is in no way limited by the previous aesthetic development of the audience. To be sure, instructional pictures must of necessity be adapted to the grade level and intelligence of the group to which they are shown, but a resourceful teacher can interpret the picture of almost any object in terms suitable to the age and capacities of her students.

A filmstrip, the old-new medium of communication in our society, is the most inexpensive medium of mass communication yet devised, providing good teaching pictures at a smaller unit cost than any other medium. It consists of a strip of cellulose acetate (noninflammable) film 35mm, slightly over an inch, wide and varying in length from 2 to 5 feet. A filmstrip in a metal container is usually mailed in a standard cloth mailing bag with label attached, or in a cardboard box. The weight of a single strip packed for shipment is so slight that it can be mailed for 3 cents.

<sup>1</sup> TAYLOR, J. Y., "Opaque Project—A New Frontier in Teaching," American Optical Company, Scientific Instrument Division, Buffalo, N.Y., 1941.



The pictures begin after a short length of blank leader, which is provided at both ends of the filmstrip to facilitate threading into the projector. These pictures are all related to one topic and are organized in a definite order. Filmstrips are printed and projected on machines with sprockets similar to those used in motion pictures.



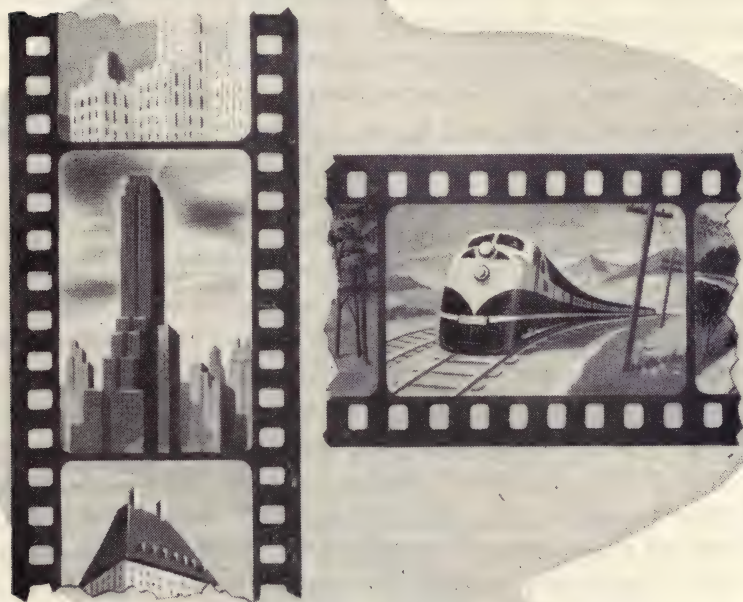
The projected pictures from either single-frame or double-frame filmstrips are equally satisfactory.  
*(Da-Lite Screen Co., Inc.<sup>1</sup> Drawing by York Studios.)*

In fact, the filmstrip's dimensions and location of sprocket holes, down both sides of the film, are exactly the same as those used for 35-mm silent motion pictures.

The size of each frame or "picture" (a frame may consist entirely of printed copy, drawings, or photographs, or any combination of the three) in the commonly used single-frame size is generally about 1 inch across and  $\frac{3}{4}$  inch high (precisely, it is 0.906 by 0.6795 inches). The proportions are the same as those of motion-picture screens and standard lantern slides. The single-frame filmstrip is run through the projector vertically. It is also possible to print the filmstrips with the frames running horizontally instead of vertically in what is referred to as the

<sup>1</sup> Da-Lite Screen Company, Inc., 2711 North Crawford Avenue, Chicago 39, Illinois.

double-frame process. In this case each picture is about 1 inch high and 1½ inches wide. The double frame may be printed either horizontally, so that the width of the picture runs along the sprocket edge of the film, or it may be printed vertically, so that the height of the picture runs along the sprocket edge. The horizontal printing



Double-frame filmstrips are sometimes printed vertically when required by the special nature of the subject matter. (*Da-Lite Screen Co., Inc. Drawing by York Studios.*)

is most usual, but the vertical is sometimes used for pictures showing a tall object such as a skyscraper or a flag pole. The double-frame strip is run through the projector horizontally. If vertical frames occur the strip can be easily turned from horizontal to vertical position, since projectors designed to take both single and double frames have swivel heads. The double frame, for instance, is commonly used in the inexpensive candid camera to enable amateurs to make larger prints of individual pictures. Possibly the only point on frame size of importance to the average user is that while the single-frame strips may be projected on any filmstrip projector, the double-frame strips can be used only in projectors designed for



them, such as the machines that project both single- and double-frame filmstrips as well as 2- by 2-inch slides.

Filmstrips suitable for projection are distributed either with or without accompanying recordings (silent or sound filmstrips). In some cases, the user has an opportunity to choose between a silent version without recordings or sound version with them. However, in most cases the filmstrip has been produced for release only as a silent filmstrip or a sound filmstrip (sound slide). In the latter case, the recordings carry a lecture or other appropriate material such as music. Some signal, a gong or a "cricket," is employed in most of these recordings to indicate when the picture on the screen should be changed. Many instructors find this signal somewhat distracting and would prefer to have it eliminated. A new sound filmstrip equipment is available that eliminates the need for audible cuing. It operates automatically from a supersonic cue, which cannot be heard by the audience, thus making sound filmstrips usable without any distraction.<sup>1</sup>

The important point for user consideration on sound versus silent filmstrips is the record player required for the sound versions. Combination filmstrip projectors and record players are on the market, specifically designed for this type of filmstrip. If this combination machine is not available, any playback or record player with appropriate speed can be used. Filmstrips are now produced with accompanying records that are designed to be played back at either  $33\frac{1}{3}$  revolutions per minute (rpm) or at 78 rpm, the standard speed of home phonographs. Of course, if a record recorded at  $33\frac{1}{3}$  rpm is played on a 78 rpm playback, the sound is so speeded up that it is unintelligible, sounding rather like Donald Duck. If a record recorded at 78 rpm is played on a  $33\frac{1}{3}$  rpm playback, the sound is so slowed down that it cannot be understood, sounding as if played on a hand-wound phonograph which had run down. The slower speed is more commonly used in radio's electrical transcriptions and these slower speed records come in sizes as large as 16 inches in diameter and make possible the uninterrupted recording of slightly more than 15 minutes' worth of material. The largest size of record for 78 rpm playback is 12 inches, which will not run for much more than 6 minutes. Of course, smaller size records are produced in both speeds depending on the length of the recording. Prior to releasing a new program of recorded material accompanied by some visual matter in filmstrip form, Lewellen's Productions<sup>2</sup> surveyed the field to determine which speed to use. Their experience was as follows:

Eighty-nine percent of schools in cities of 2500 or larger own their own record players. By a great margin, these are 78 r.p.m. only. There are comparatively few  $33\frac{1}{3}$  only players and a slightly larger number of dual-speed players.

<sup>1</sup> Aids Equipment Corporation, 131 West 52d Street, New York 19, New York.

<sup>2</sup> Lewellen's Productions, 8 South Michigan Avenue, Chicago 3, Illinois.

It would seem, then, that recordings should be most acceptable in the 78 r.p.m. speed. Schools which have dual-speed players can use them as easily as the schools which have 78 r.p.m. only players. Further, any school which has a 33 $\frac{1}{3}$  r.p.m. only player is very likely to be very audio-visual conscious and will have a 78 r.p.m. playback, too.

Projection requirements and expedients for sound filmstrips will be discussed more fully in the chapter devoted to that topic.

Of course, anyone can record a lecture to go with existing silent filmstrips, so that any filmstrip subject is potentially "sound." Moreover, many teachers find that some sound filmstrips can be used more effectively without the record, especially in cases where the pictorial material contributes effectively to interpretation of the subject matter. Thus the distinction between sound and silent filmstrips is not so definite as it might seem at first glance.

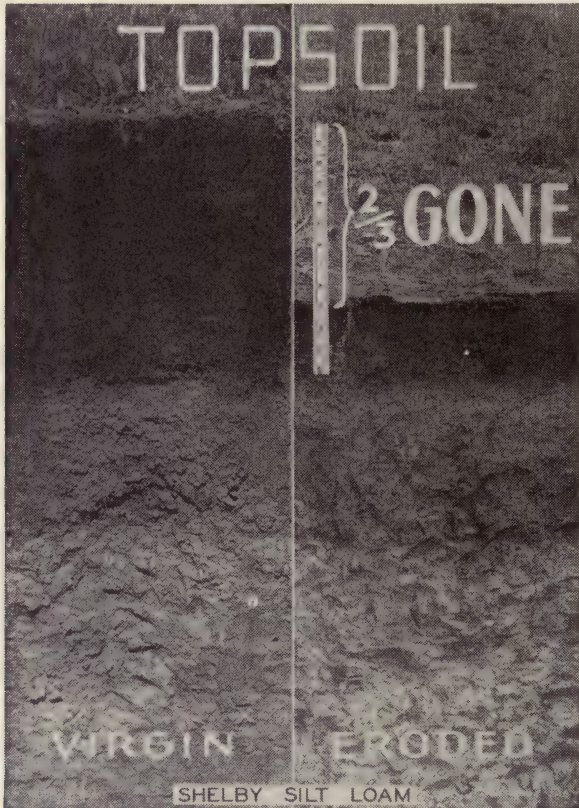
There is a definite distinction, however, between the filmstrip designed for projection and various other uses of strip film. A common toy derived from the old-fashioned stereopticon employs a strip of 35-mm film printed with double-frame stereopticon pictures, seen through a two-eyepiece viewer that is held immediately in front of the eyes facing some light source. Although some refer to the films for these viewers as filmstrips, they are not considered so in the context of this book. Another use of the word "filmstrip" has recently been made in marketing a monocular viewer using the narrow-gauge 16-mm film, also with double-frame pictures. The purpose of the manufacturer in this instance is to make projection impossible and thus obtain permission to use characters originally developed for the motion-picture theater without infringing on the rights of the theatrical exhibitor. Although the material available in these 16-mm double-frame strips might be made suited for school use, it cannot be effectively and economically used in its present form.

A much bigger use of strips of film is in the various microfilming procedures. The microfilm process can be adapted to the recording of any printed material on film, primarily to gain in storage space and ease of handling. While the majority of microfilm material can be projected on the screen (it is usually 35-mm double-frame) this use will not be considered in this book since it is nothing more than a mechanical reproduction of the printed page and as such does not need to receive any special attention. Microfilm viewers are usually constructed with translucent screens designed for individual readers, and the length of the strip of film is determined by the number of printed pages reproduced. Some microfilm documents are frequently many times the length of the conventional filmstrip.

In filmstrips designed for projection, the treatment technique takes a number of forms. A large majority of the silent strips use both text and pictorial material. In some of these, text frames and pictorial frames alternate. Sometimes the text



frames contain lengthy material, often running well over 25 words on one frame, which results in reduced legibility. Others use this alternating technique to provide only simple, brief picture identification on the text frame. Another method of incorporating printed material in the filmstrip is the superimposed caption, which

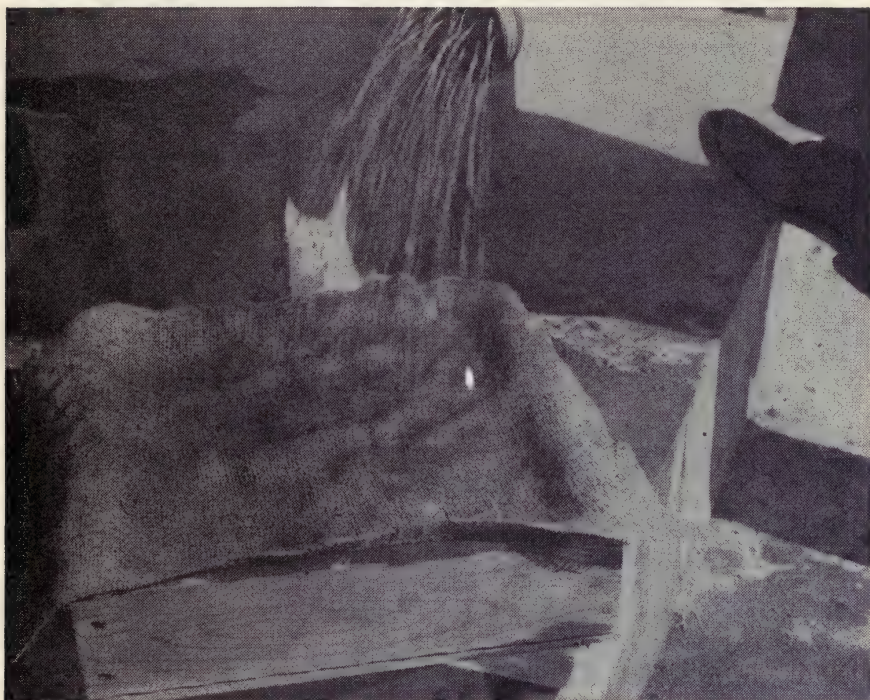


A visual use of the superimposed caption. From filmstrip "Soil Erosion in the United States."  
(*Soil Conservation Service, USDA.*)

appears on the same frame as the picture, usually at the bottom. These superimposed captions tend to be considerably shorter than the material that appears on separate frames. Filmstrips with printed material use either the text frame or the superimposed caption, or a combination of both. Newer productions show a tendency toward brevity in words, putting the emphasis on visualization.

Some silent, and most sound, filmstrips consist entirely of pictures with no text or captions whatever. Usually with silent filmstrips of this type lecture notes are provided. This all-picture material has the advantage of being easily adaptable to

individual class needs and to several age levels. However, such adaptation does require adequate teacher preparation, and if the manual or guide containing the information concerning the strip happens to be mislaid prior to preview of the strip, there may be some difficulty in definite identification of the pictures shown.



Typical uncaptioned frame showing one step in preparation of flats for planting vegetable seeds. From filmstrip "Home Grown Plants for Transplanting." (*Bureau of Plant Industry, Soils and Agricultural Engineering, USDA. Photo by W. J. Mead.*)

Whether or not the strip includes narrative in any form, the pictorial material will present photographs, drawings, diagrams, reproductions of paintings, or any other similar matter. Although many of the early productions consisted entirely of photographic material, newer strips introduce other visual forms where best suited. Some strips consist entirely of drawings. It is not important which type of picture is used, if the picture itself really visualizes the material being presented and employs close-up, medium shot, and long shot where each is needed.

One technique incorporates devices for active audience participation. This is particularly true of the newer releases. These devices may be direct questions for factual information or for development of discussion, or sample problems to be



solved by the group before the solution as worked out in the filmstrip, or outline summaries to be filled in by the class, or identification quizzes, or reviews and short tests which appear at the end of a complete sequence or at the end of the entire strip. One of the newer approaches to the end review or test is the "photo quiz," used by producers such as Popular Science Publishing Company, Row, Peterson and Company, and the Syndicate Store Merchandiser. The photo quiz consists of



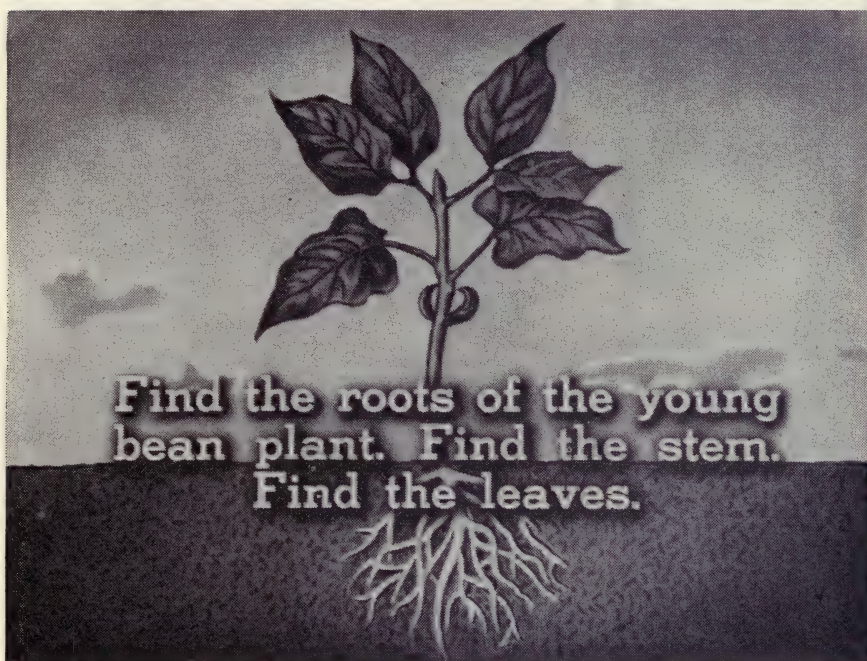
Typical frame from a filmstrip made up entirely of drawings. From color filmstrip "Ivanhoe."  
(*Pictorial Films.*)

pictures, usually repeating some of those used earlier in the strip, in which the students are to find answers to specific questions. For example, the class may be required to identify objects or actions, or to locate errors. The photo quiz not only motivates testing but also makes the visual images an integral part of the student's experience.

The question technique has been used to its greatest extent, perhaps, in filmstrips designed for use in conjunction with motion pictures. Those produced by the U. S. Office of Education are a good example of this, since these strips review the information given in the motion picture posing questions and problems for the audience. Other filmstrips produced for use in conjunction with motion pictures, such as

those produced by Encyclopaedia Britannica Films and by Young America Films, do not use this approach but are designed to be more self-sufficient.

Another approach to filmstrip presentation is the use of a story device to present the instructional material. This has been done in several strips designed for the lower elementary grades, for instance, those presenting social studies material, such as the life of a small Indian boy. Here the story device is probably most successfully



Example of "photo quiz" technique, from filmstrip "How Plants Live and Grow," designed specifically for the lower elementary grades. (*Popular Science Publishing Co.*)

used. However, a number of sound filmstrips, in the field of salesmanship and of foremanship, for instance, have also employed story devices. Since these subjects are for a more mature audience, the necessity for such attention motivation is negligible, and the story device often does nothing more than lengthen the presentation.

Many filmstrips, particularly in connection with story devices, employ cartoon characters as personifications of various abstract qualities, as in one of the industrial-safety strips using a cartoon figure to personify Carelessness. Some of these are excellent visual devices, adding to the instructional value of the strips; others add little or nothing, however, lacking even interest value.

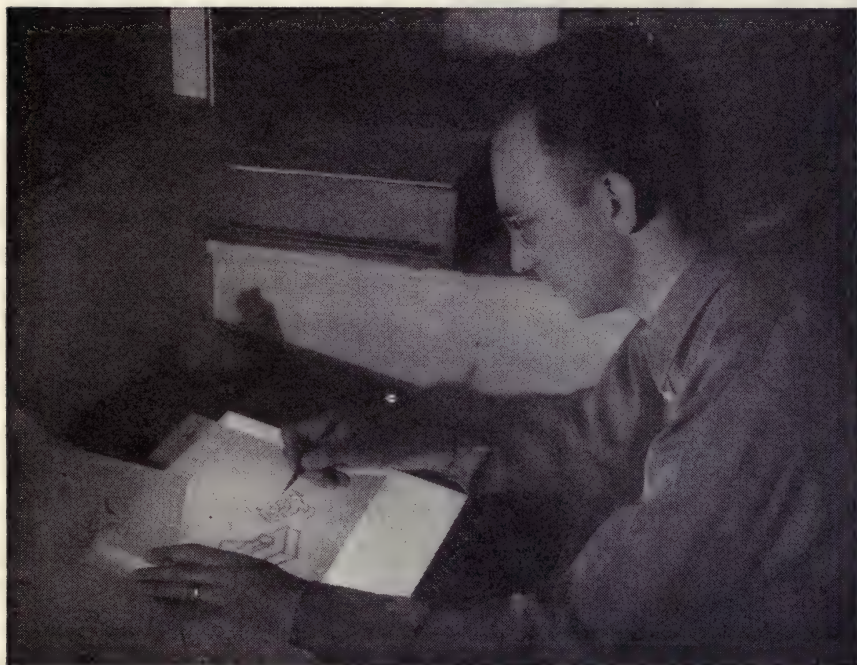
As was mentioned above, the sound filmstrip often consists entirely of pictorial





small children; however, such flaws may be in the original art work rather than in the color process.

In limiting this book to filmstrips suitable for projection, the aim is to provide in one place all the information that can be helpful to those interested in using filmstrips as a part of group activity. The group-activity purposes, especially in school and college, for which available filmstrips are most suited are (1) demonstra-

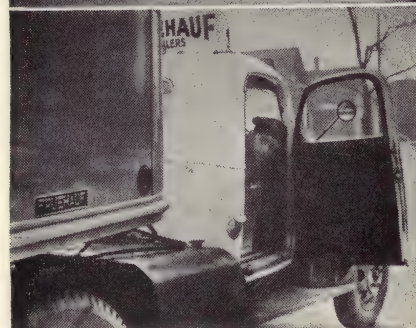
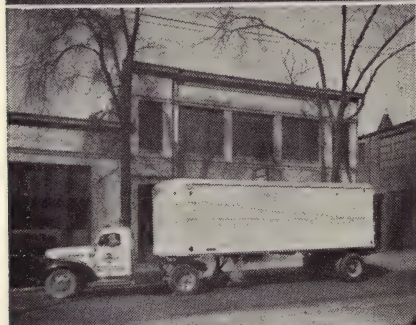
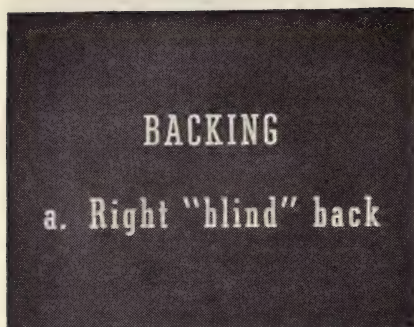


Motion-picture animation techniques are frequently used to create filmstrip cartoon characters.  
(*Photo and Sound Productions.*)

tions of skills, (2) direct teaching, (3) illustration, and (4) supplementary instruction. Filmstrip types in each of these categories are described below.

The skill demonstration or "how-to-do" subjects treated fall into two major groups—the simple and the complicated. An example of effective visual presentation of a simple skill is found in the Fruehauf Company's instructional strips for tractor-trailer operators. Here photography and diagrams are combined with succinct captions. Several operational skills are presented factually, in carefully organized sequences, ranging from the simple to the more difficult. In the treatment of the simple skill, the best filmstrips employ little textual material, allowing the pictorial material to show the step-by-step procedures. A direct factual approach,





without extraneous material such as story devices, is generally most effective, particularly if diagrams and close-ups are used where required for clarity and emphasis.

The more complicated skills usually require certain differences in treatment for greatest instructional value. Generally the presentation demands inclusion of such difficult-to-visualize matter as abstract principles, mathematical computations, or time and space relationships that cannot be photographed or drawn. This makes necessary the use of more detailed captions and explanatory text frames if the strip is to be self-sufficient, unless an accompanying recorded lecture is used. However, this necessity for verbal explanations does not mean that the text material needs to be overdone or used where visualization is possible. The more complicated the skill, the less important it is to present in a filmstrip the entire operation being studied. In fact, the filmstrip can make its greatest contribution in the demonstration of complex skills if the strip is used to show those phases of the operation which can be most appropriately visualized, acting as a steppingstone for the instructor's presentation of the whole process. After all, the instructor's contribution is the most important factor in the teaching of skills. Filmstrips or any other visual aid can only assist the instructor when it is restricted to doing that portion of the

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Effective picture sequence demonstrating a simple skill. From filmstrip "The Man Behind the Wheel." (Fruehauf Trailer Co.)

teaching job to which the individual medium is best suited. The pictorial material best suited to treatment of the more complex skills generally includes a greater proportion of diagrams, sectional views, or cutaways. It is in visualizing small or hidden parts and complex operations that the filmstrip can be most helpful to the instructor.

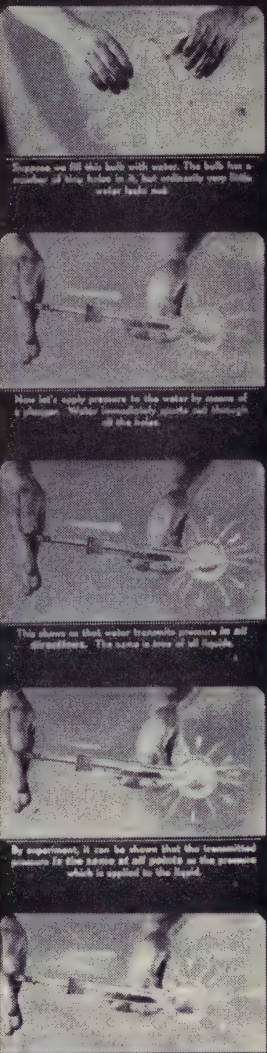
One technique of treating an advanced skill is that used in the case of filmstrips dealing with the slide rule. The main teaching problem in presenting the slide rule to groups is that it is difficult for the instructor to be sure that each group member has set the slide rule correctly without personally inspecting every class member's rule. The only substitute for this time-consuming process is the use of the "jumbo" rule, which is cumbersome, awkward, and expensive. The correct settings are not only shown in the filmstrip, but specific problems are presented enabling the student to follow slide-rule technique step by step.

Another effective treatment involves the use of a visual device, as in the explanation of the development of basic blueprint views. From this sequence, the group members get an understanding of the relationship of the drawing and the object itself, making the reading of a blueprint more meaningful to the novice. Of course, the instructor in this case could employ much the same device by unfolding a large box, but this would have the disadvantage of showing only one side or end at one time. The basic criterion for selecting a visual device is that the device itself be easier to comprehend than the subject itself. Of course there is no point in using a device if too great an instructional detour is necessary; therefore, it is generally desirable that the device be selected from everyday experiences.

Two major treatments have been employed in

This demonstration example indicates a type of filmstrip approach suitable for direct teaching by the lecture method. From "Transmitting Pressure Through Liquids." (*Jam Handy Organization*.)

**LESSON 1**  
**Liquids Transmit Pressure**



Suppose we fill this bulb with water. The bulb has a number of tiny holes in it, but ordinarily very little water leaks out.

Now let's apply pressure to the water by means of a plunger. Water immediately spurts out through all the holes.

This shows us that water transmits pressure in all directions. The same is true of all liquids.

By experiment, it can be shown that the transmitted pressure is the same at all points as the pressure which is applied to the liquid.

For instance, if a pressure of 5 pounds per square inch is applied to the plunger, then the pressure at every point in the bulb will also be 5 pounds per square inch.



handling materials for direct teaching, particularly of academic subjects. The most complete provides an organized presentation of an entire topic. An example of this treatment is the Young America Films series on American government. Each strip provides a brief and self-contained summary of the important points on one governmental department. In these, the instructor finds a lecture outline that can be expanded as required by class needs. A fuller "complete" lecture treatment is found in sound of the sound filmstrips, such as the Westinghouse series on electronics. Here the lecture itself is given, rather than an outline. Both the silent and sound types of this treatment can be of assistance to the instructor, although many may feel that the silent type is preferable since it can be adapted to individual needs more easily. This approach in filmstrips technique can lead to oververbalizing, both in silent and sound versions. The best strips of this type, however, limit narration and allow the pictorial content to carry as much of the instructional load as possible.

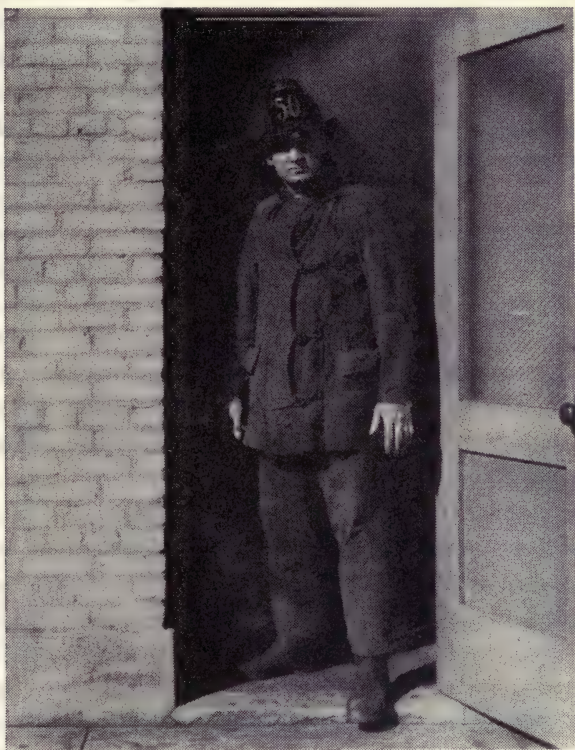
The second major type of direct-teaching strips is closely related to that described above, but differs by presenting only some of the major aspects of a topic and generally treats of a topic larger in scope. In the best of this type, the aspects presented in the filmstrip are those to which visualization can contribute most. Of course, with this type of material it is necessary for the instructor to do more than merely expand or explain the phases presented in the filmstrip.

For direct teaching, particularly of lower elementary or primary subjects, another treatment is often used. This consists of uncaptioned photographs or drawings organized to present important phases of one subject, a visual lecture outline. From this the teacher can develop various activities such as oral composition, drawing, or related reading. A good example of this for kindergarten or primary uses is the Stillfilm Company's "Kindergarten Series" which deals with such topics as the fire department, community workers, the post office, ships, and trains. For example, the strip on the fire department shows the activities and services of such a department, with the pictures arranged in a logical progression. A similar visual treatment has been used for a recently produced series for primary arithmetic. Another treatment, more fully developed in the newer filmstrips, is the use of children of the same age as the class to which the strip is to be shown as characters in a story about the subject matter being presented or as demonstrators of activities.

It is in the filmstrips designed for direct teaching that student participation devices, summaries, reviews, and tests are being included. The treatment of such inclusion varies from scattering the "activity" frames throughout the strip to presenting it only at the end of the entire strip.

Filmstrips for reading or literature classes have afforded an opportunity for the development of a storytelling treatment unique to that subject matter field. These

strips tell an entire story with briefly captioned illustrations of all the major events and characters, following the plot or organization of the tale itself. In relating such stories as "Ivanhoe" or "Treasure Island" the captions are adapted quotations from the book itself, retaining the original style and phrases. In storytelling treatment of fairy tales, the captions are generally simple enough for lower elementary practice



Example of uncaptioned frame from primary grade discussion filmstrip "The Fireman."  
(Stillfilm Co.)

or supplementary reading. Particularly when used in the lower grades, this treatment with superimposed captions is almost always preferable to the older method of alternating pictures and text frames, since it is sometimes difficult for small children to remember the picture clearly while reading the text on the next frame.

Filmstrips suitable for illustrative purposes fall into two categories. One group might be described as a picture file. This type consists of a series of photographs, generally with some identifying captions or brief text, illustrating the subject being presented but not attempting to provide any interpretation or additional facts. Such



picture-file strips are most often found at their best in regional and political geography subjects. The Filmette Company's "Characteristic Landscape Views" series is an excellent example of carefully selected illustrative photographs.

The other category of illustrative filmstrips are those which present a series of examples, as of applications of abstract principles. For instance, the Jam Handy Organization's two-part filmstrip on "Applications" in their "Basic Electricity" series provides a series of such examples. The example treatment may also be found in nature study and biology materials, giving examples of various plants or animals in particular orders, or in filmstrips presenting examples of paintings or architecture. The illustrative treatments are most valuable in those fields where it is desirable to have a fund of pictorial material, particularly of subjects which cannot otherwise be easily seen. If the pictures are well selected and provide enough different illustrations so that the teacher can choose for emphasis those most pertinent to the individual classes' needs, such filmstrips can be a real visual aid.

Supplementary school uses of filmstrips include chiefly "picture reading" and auditorium presentation. Picture reading can be compared with supplementary reading of books, texts, magazines, etc. Such filmstrips usually treat small phases of subject matter which are not generally dwelt upon during class time but hold specific interests for individual students. Use of these filmstrips will be described in more detail in the next chapter.

Auditorium purposes for filmstrip use include incorporation of suitable strips into travel talks, safety lectures, and programs for holidays, such as Lincoln's Birthday, Arbor Day, or Christmas. Visual materials on literature or reading might be useful in auditorium programs designed to stimulate outside reading. Filmstrips best suited to such purposes should be high in interest value as well as containing the subject matter desired. It is in the auditorium presentation that the story-device treatment described earlier can be most effective, if the story is well selected, original in idea, and properly coordinated with the information it is intended to present. Using filmstrips for this purpose is also often helpful to students who are to give talks and is quite similar to the use of filmstrips in adult groups including farm organizations, women's clubs, churches, etc.

The source of a filmstrip or any other teaching material is relatively unimportant to the teacher. The unimportance of the source per se is sometimes more exaggerated in the case of filmstrips than in any other item usually acquired for classroom teachers. In most cases the teacher or the school administrator is anxious to have some regional representative who will be available to maintain equipment, or supply replacements, or assist in mechanical problems. However, with filmstrips there can be no maintenance assistance which could be appropriately rendered by a dealer (if a patch is to be made in the filmstrip it can be made on any 35-mm

motion-picture splicer available in the local theater—splicers with which filmstrip dealers are not usually equipped). Replacements have to be ordered from the original source by the dealer, and can just as well be ordered directly by the user. As will be seen under Projection, any child can learn all that is necessary about filmstrip projection from the simple directions accompanying the equipment, and the equipment dealers supply whatever information is necessary in the replacement of worn-out lamps, selection of screens, and room-darkening facilities.

However, the individual filmstrip users will want to know something about filmstrip sources, prices, and methods of distribution before planning the expenditure of funds. All known primary filmstrip sources are listed in the back of this book. A simple postcard request addressed to these organizations will bring free price lists, etc., and information about local dealers, if any, as well as news of any new filmstrips released since March 15, 1947. Filmstrip prints, or copies, are relatively inexpensive. For example, prints of a 50-frame strip cost about 30 to 35 cents apiece when ordered from a laboratory in quantities of 200 to 300 prints at one time. The list price of a strip accounts for this print cost (which includes cutting, rolling, and packaging in containers), royalty to the author, production cost amortization, and distribution charges. For school customers there is sometimes a discount on list price. Such discounts are most common on filmstrips originally produced for other purposes, such as industrial or business training.

The filmstrips in this book available for manufacturing and handling cost were produced by the U. S. Department of Agriculture and are available exclusively from Photo Lab. Certain U. S. Navy filmstrips are available through Castle Films at a slightly higher price range. Castle Films also distributes the productions of the U. S. Office of Education for \$1 on which a royalty is payable to the U. S. government under the act of Congress which authorized the production of visual aids by the U. S. Office of Education. Of course, some sponsored filmstrips supplied by industrial sources are available for print cost or free of charge, but the majority of other strips described in this book are sold at a price designed to give both the distributor and the producer a fair return on their investment. In evaluating the prices indicated throughout this volume it is appropriate to bear in mind that the cost of color printing is approximately five times the cost of black-and-white printing and that print cost varies with the number of prints ordered by the producer at a given time, as well as by the laboratory and printing process used. If the royalty payments for filmstrips are evaluated in terms of the customary textbook royalties, it is generally apparent that the producers and distributors of filmstrips make a much smaller profit per classroom unit.

Some filmstrip users may have the impression that because they are familiar with one or two sources of filmstrips these larger sources have the monopoly on



this medium of communication. This misconception may arise from the fact that projection-equipment salesmen have of necessity been forced to emphasize the filmstrip libraries with which they were familiar in order to make equipment sales. Since these salesmen frequently also handle motion-picture equipment, opaque projectors, and other audio-visual devices, their information on sources of filmstrips for instructional use has often been limited to a few names such as the U. S. Department of Agriculture (Photo Lab), U. S. Office of Education (Castle Films), Society for Visual Education (a commercial organization), and the Jam Handy Organization. It will be apparent from a quick perusal of this book that these large organizations are not alone in supplying filmstrips suitable for school and college use. Although the number of strips from each large source is in the hundreds, the large library is in itself of little help to the classroom teacher since her problem is one of selection.

The size of the source does not usually affect the purchase price nor the quality of an individual strip. Therefore, an instructor gains little by dealing with an individual source other than the saving of correspondence with more than one source. This insignificant advantage is more than counterbalanced by the advantages of a careful investigation of the individual titles available in the subject matter desired from all possible sources. Although the larger sources sometimes maintain branch offices, the postage on filmstrip shipments is so small that these regional offices can be of little assistance for anything except personal visits. For example, the Stanley Bowmar Company,<sup>1</sup> representing the SVE in New York, is very helpful to teachers located in the metropolitan area in allowing the review of strips in their offices, but a teacher as far away as Albany can receive little assistance from a New York representative that would not be available as readily from Chicago. Filmstrips are such an inexpensive commodity that their sale price can never justify an extensive network of salesmen handling filmstrips alone. Consequently, it is possible that the organizations with the smallest overhead may give the best filmstrip value to the user. A good example of the minimum overhead combined with maximum academic value can be found in the case of Filmette Company, which is operated in the private dwelling of Dr. and Mrs. Drucker, who brought the negatives of the filmstrips they distribute with them from central Europe.

The basic problem in filmstrip merchandising is that the list price is frequently so small that provision of screening prints is impractical. Unfortunately, filmstrip distributors have not yet adopted the general policy so common in the textbook industry of supplying materials on a 10-day free examination basis, allowing the

<sup>1</sup> The Stanley Bowmar Company, 2067 Broadway, New York 23, New York.

return of unsatisfactory materials without obligation after a few days for review. A very efficient system for filmstrip review, completely eliminating the possibility of film damage, is practiced by Stillfilm, Inc., which incloses a printed card with each preview shipment stating that the strips may only be viewed through the fingers unless they are purchased. If strips are not projected, but merely "reviewed" by holding them up to the light between the fingers (with the thumb on one edge of the strip and a finger on the other edge so that no fingerprints are made on the strip itself) there is little possibility for as much wear and tear on the filmstrip as on a textbook sent for review. It is certainly unreasonable for any teacher to be expected to select teaching materials without seeing them first, and consequently more progressive filmstrip producers are supplying preview prints in spite of the high cost of this service. Users can show their appreciation by very careful handling so that filmstrips returned from preview are in good enough condition to be sold as new.

Distribution of filmstrips is frequently handled by the producers themselves, as in the case of Young America Films, the Filmette Company, Stillfilm, Inc., Visual Sciences, the Jam Handy Organization, Popular Science Publishing Company, and others. With this type of distribution, which provides a library from one producer only, the quality of filmstrips varies little except for improved techniques in more recent productions. This is an advantage to the individual teacher in the selection of strips, as the problem of suitability of treatments and technical quality is much simplified. Other distributors, such as the Society for Visual Education or Brandon Films, handle not only their own product but that of other producers also. The former also distributes some sponsored filmstrips, such as the series on air transport and travel sponsored by United Airlines. Such a library, of course, has an unevenness of technical quality, treatment, and effectiveness of visualization. There is a possible advantage to the teacher in saving correspondence. Others, such as the regional distributors, are not producers themselves but carry the product of several of the producing companies. Regional distributors are not listed in this book, as primary sources only are indicated. However, names and addresses of regional agents will be supplied, if desired, by those listed distributors or producers who have such agents.

For some time certain producers tended to specialize in particular subject matter areas, but this is in most cases no longer true as these producers are turning their attention to other fields also. For instance, the Jam Handy Organization's material contains a great percentage of vocational training strips, as in machine-shop work and aeronautics, and some materials in physics. While the company still continues in the production of similar topics, materials on nature study and



general science are being added as well as more production on salesmanship. Visual Sciences, as its name implies, confines most of its production to the various fields in science, but has recently released strips in other, although related, fields.

There has also been a tendency to specialize in materials for particular grade levels, and although this tendency is also changing somewhat, the difference is not yet so noticeable as in the expansion of subject matter treated. Recently the filmstrip designed specifically for discussion purposes has been receiving considerable attention from various producers. Such filmstrips are often aimed at adult groups, but offer excellent material for high school and college classes as well. Film Publishers, for instance, has been emphasizing this type of material, which is organized so as to stimulate discussion on such topics as atomic energy, racial intolerance, and international affairs. Other examples, besides the Jam Handy Organization and Visual Sciences, of the educational level tendency and subject matter specialization follow. It will be well to keep in mind, however, while reading these generalizations as to scope of particular libraries, that each includes other materials also, since the examples indicate content and level of a large proportion of the library only and not of the entire production.

American Council on Education—mainly materials in the social sciences, for junior and senior high schools, with some applicable for adult discussion groups.

Audivision, Inc.—salesmanship, supervision, and related subjects in business field, designed specifically for use in business or industry, but applicable in senior high school or college courses.

Brandon Films, Inc.—social sciences and personnel supervision or foremanship; designed mainly for adult groups but applicable in school situations.

Business Education Visual Aids—subjects for business training courses, such as accounting or bookkeeping, for high school or beginning college courses. May be used for adult education also.

Castle Films Division—mainly vocational training in various fields, for use in senior high schools, vocational schools, colleges, and for industrial training programs (filmstrips originally produced by U. S. Office of Education, U. S. Public Health Service, U. S. Navy, and the Army Air Forces).

Curriculum Films, Inc.—little tendency to specialize; include material on mathematics, English, fairy tales, and sports. Range in level from primary grades to senior high school.

Dartnell Corporation—salesmanship; designed specifically for use in business or industry, but applicable in senior high school or college classes.

Encyclopaedia Britannica Films, Inc.—social studies; range from elementary to high school.

- Eye Gate House, Inc.—emphasis on social studies with a fairly large group in elementary science also; elementary grades and junior high school.
- Filmette Company—considerable material on European history and history of art; social sciences and the sciences treated in relatively smaller groups; senior high school and college with some materials applicable in upper elementary grades.
- Film Publishers, Inc.—the social sciences, emphasizing timely topics. Senior high school and college; adult discussion groups.
- Foley and Edmunds, Inc.—social studies, particularly geography; elementary grades with some materials for junior high school.
- Informative Classroom Pictures Publishers—social studies; elementary grades.
- Long Filmslide Service—social studies and elementary science; elementary grades and junior high school.
- National Agricultural Supply Company—vocational agriculture; senior high school, college, and adult groups. Distributes filmstrips prepared by Vocational Agriculture Service, College of Agriculture, University of Illinois. Plans in progress for own production.
- National Safety Council, Inc.—safety, including street, road, industrial, etc. From elementary grades to college. Many suitable for adult groups. Distributes safety subjects produced by others in addition to own productions.
- Photo and Sound Productions—vocational training, foremanship or supervision, designed for industrial uses, but applicable in vocational schools, senior high schools, or college. Beginning to produce subjects in other areas also.
- Pictorial Films—literature, junior and senior high school, although useful with other groups interested in same stories.
- Popular Science Publishing Co.—emphasis on social studies, but materials in other areas such as punctuation, arithmetic, hygiene, etc. Level range from primary through high school, but major emphasis on materials for primary and lower elementary.
- Stillfilm, Inc.—social studies with emphasis on geography and history, with groups on nature study and other topics also; level ranges from primary or kindergarten materials through junior high school.
- Society for Visual Education—no tendency toward definite specialization, although large proportion of materials deals with social studies; range level also large with considerable material for lower and intermediate elementary grades. A number of their older productions are reported to be currently undergoing revision.
- Syndicate Store Merchandiser—retail selling; designed specifically for training



of variety-store sales personnel, but applicable to senior high school or college classes interested in the subject.

U. S. Department of Agriculture—agriculture and related subjects (*i.e.*, home economics, forestry); high school, college, and adult groups.

Vocational Guidance Films, Inc.—entirely vocational guidance materials for high schools.

Young America Films—little tendency to specialize; include reading, health, government, and others. Range in level also large—elementary, junior, and senior high school.

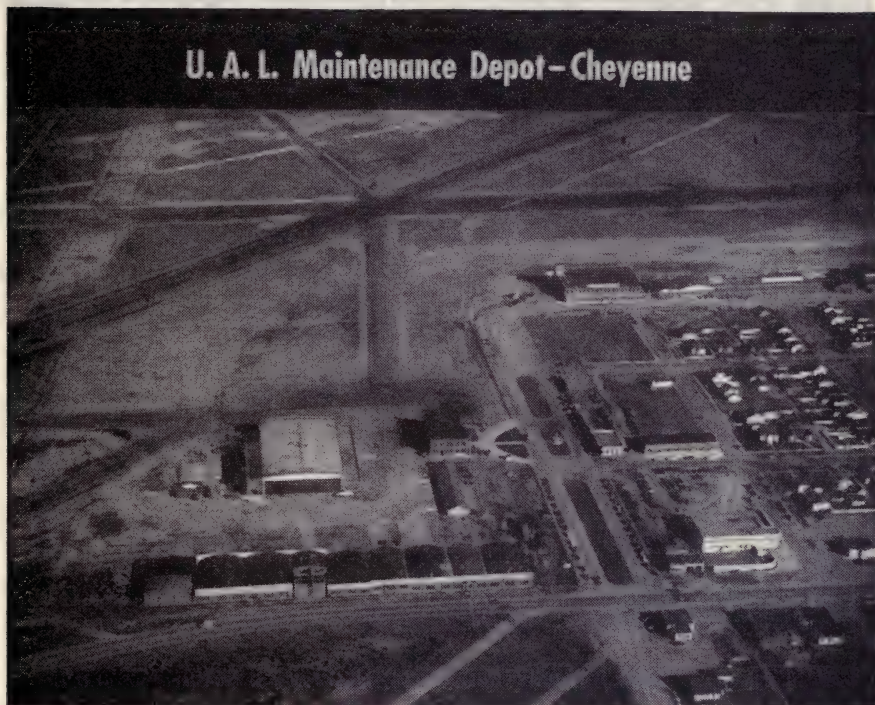
In addition to the commercial producers and distributors and the Federal agencies which produce visual aids, there are others which should be mentioned separately. Some of the information offices of other countries have produced one or more filmstrips about their own lands. These strips generally provide information on such aspects as geography, industry, history, government, and place in world trade. As may be expected, the factual material is excellent and, contrary to the fears of some instructors, is singularly unbiased. Most of this material is suitable for high school classes, supplementary material for college classes, and for adult groups.

Another group is comprised of various associations and societies, interested in disseminating information on specific subjects (such as the National Safety Council, the National Tuberculosis Association, the Better Vision Institute, National Conservation Bureau, and the National Society for Prevention of Blindness). The size of these libraries varies from one or two filmstrips, as in the case of the National Tuberculosis Association, to selections of 20 to 30 strips as in the case of the National Conservation Bureau. Naturally, each of these producers deals only with the subject matter pertinent to the over-all purpose of the organization. Usually there is an attempt to provide materials for all age levels which should receive the information, from children to adults, with a few technical strips as for instance "Selective Enforcement," which deals with traffic safety from the traffic squad's point of view.

Two types of filmstrips are available from industrial producers. First there is the so-called "sponsored" filmstrip, which is generally designed as institutional advertising or for public-relations purposes. Again contrary to the opinion of some individual instructors, the sponsored filmstrip in many cases is not so biased as might be supposed and often has definite contributions to offer. Examples of some of these which are well made technically, well visualized, and organized for effective classroom use are "How To Cook Meat By Dry Heat," sponsored by the National Live-stock and Meat Board, "Sound," sponsored by General Electric, and the railway transportation series sponsored by the New York, New Haven and Hartford Rail-

road. In these particular examples little or no advertising whatever appears; the subject matter is treated factually. Other strips include some direct advertising but in a manner that is not offensive or overly obtrusive.

The other type of industrial filmstrip is the training strip designed either for training users of the company's product or for training the company's own personnel. Of those designed for training users, a good example is the Carboloy Com-



Sample frame from a sponsored public-relations filmstrip showing the facilities of the sponsor.  
From "Coast to Coast Geography from the Air." (*United Air Lines.*)

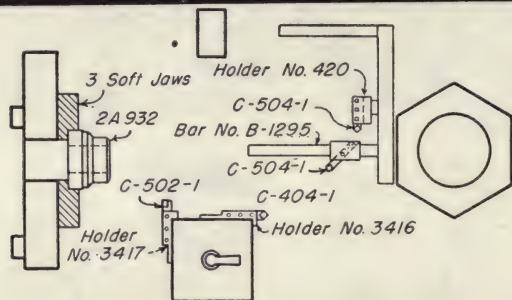
pany's series on Carboloy tools. This series is accompanied by excellent manuals for the trainees, which contain not only the information presented in the filmstrip so that it is readily available for reference but also pertinent glossaries, tables, scales, and similar matter. The Kearney and Trecker Corporation have also issued a training series of this type, dealing with their milling machine and its proper operation, and Linde Air Products Co. have issued an oxyacetylene-welding series providing training in fundamentals, operations, and safety precautions. Filmstrips designed specifically for in-company training are now becoming available to outside users also. For instance, the Fruehauf Trailer Company has produced two tractor-trailer



driver strips, accompanied by trainee manuals, which were designed for their personnel and the users of their product. Upon being queried concerning availability to schools desiring subject matter of this nature (in order to ascertain whether these strips should be included in this book) the trailer company indicated that it had not

**With this information at hand, you are in a position to design a specific tool to fit the specific job**

**JOB LAYOUT SHEET**



OPERATIONS	R.P.M.	FEED		CUT FEET
		T. POST	TUR.	
Turn large dia. to chuck jaws, 1 cut	C-502-1	402	.015	275
Bore 1/16" small, 1 cut.	C-504A-1	"	.015	225
Turn smaller dia. 1 cut.	C-404-1	"	.015	250
Chamfer small dia.	C-504-1	"	.015	250

A sample frame from a sponsored filmstrip designed to train users of a specific product. From filmstrip "Designing Carbology Tools." (Carbology Company.)

occurred to them to release the strips in this manner, but that they would be glad to make the materials available to any instructional group interested. This is also true of the same company's series of strips designed for their own salesmen and their dealers. Another example is the training series prepared by the Syndicate Store Merchandiser for personnel training in variety stores. These are now available to other interested users also and can be helpful in classes dealing with retail selling. One of the series, "Tommy and His Fountaineers," can also be of assistance in training school-lunchroom or cafeteria personnel. Both types of industry-produced filmstrips for training purposes are technical in nature, and generally explain the operations exceptionally clearly and simply.

The industrial training filmstrips are generally distributed by the companies that produced them. The sponsored public-relations and advertising strips may also be distributed by the sponsoring company, but sometimes receive additional distribution through other agencies, such as regional distributors and those filmstrip companies who handle both their own product and that of others. The price to users varies. The training materials are often sold, much as other filmstrips are, with royalty payment added to print cost and handling charges. However, some of these are available on a rental basis, which is not true in general of the filmstrips produced expressly for sale. The public-relations or advertising strips are usually available either for a nominal handling fee or on a loan basis in which the user pays only transportation charges. Some companies, such as J. I. Case Company, are making their strips available for purchase at print cost.

Textbook publishers are becoming increasingly interested in the possibilities of filmstrips to be used with textbooks. A few, such as the Macmillan Company, Row, Peterson and Company, and the McGraw-Hill Book Company, Inc., are currently producing filmstrips especially for use with some of their books. Another approach is that of the American Book Company, which publishes leaflets and teacher's guides describing filmstrips available from other sources which can be effectively used with their texts. The publishers who produce their own filmstrips usually distribute them directly. The publishers who refer to strips produced by others generally restrict themselves to giving information on sources as well as suitability.

## CRITERIA FOR SELECTION

When the individual classroom teacher, group or club leader, training instructor, or other filmstrip user comes to the task of selecting the specific filmstrip that is to be used, the procedure may vary but should probably take into consideration the same factors. Perhaps the most important is to decide first exactly what part of the subject matter should be presented by the filmstrip medium. Of course, since filmstrips have not been produced on all topics, it may be that none exists for the particular subject for which such treatment is desired. But, there is little point in using a filmstrip to emphasize an obscure or minute point merely because a strip is available on that topic; therefore, it is more desirable to select a strip to fit the need and not to select a need to fit the filmstrip. Once the subject matter area is chosen, it is well to know for what purpose the strip is desired; that is, for review, for introduction of a unit, for discussion, for direct teaching, for demonstration, for illustration, or any other purpose that the user may have in mind. This decision is helpful in the selection of a strip since different filmstrip treatments and techniques serve different instructional purposes best. When the user knows exactly what kind of filmstrip



would be the ideal selection, the existing filmstrips concerning the subject matter can be considered. Undoubtedly, although some excellent filmstrips are on the market, the user may find that none is exactly what is desired. However, the pre-selection decisions can assist in selecting the one nearest to the ideal.

There are other points to keep in mind during the actual selection. Does the vocabulary used suit the age level of the group to which it is to be presented? And is the approach and treatment suitable for the group? A too elementary vocabulary



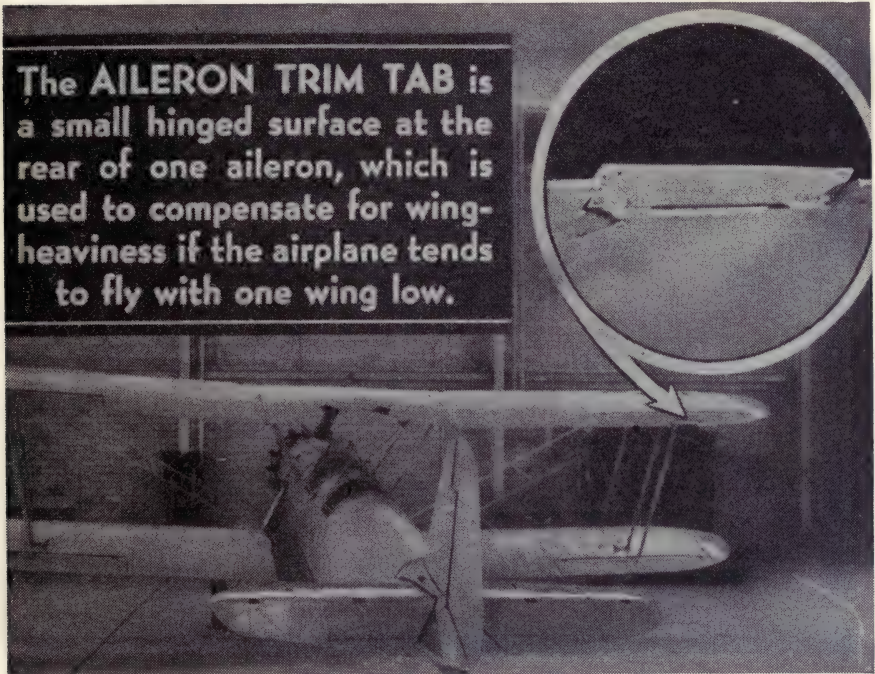
"What does she think we are—children?" (*Filmstrips, Inc.*<sup>1</sup> Drawing by Frank Pagan.)

or a too juvenile approach or device can be just as undesirable as difficult vocabularies and advanced treatments. In some cases, particularly in some materials designed for elementary grades, it may be found that the vocabulary and the approach are of the proper level, but that the tone of the entire strip is one of condescension, talking down at the children instead of talking with them. Such treatment can obviate much of the teaching value of the presentation. For instance, in the selection of strips for lower elementary health classes two titles may present the same material equally well, but one states the health rules categorically without providing any acceptable reasons for them while the other stresses reasons for such rules that appeal to the children themselves, providing excellent motivation for observing the precepts taught. Of course, the teacher could supply the motivation if the first hypothetical example were used, but would have the added task of breaking down the possible barrier of resentment on the children's part at being "lectured" at. If the filmstrip can present the facts from the viewer's own point of view, it approaches success as a real aid.

If approach, treatment, and tone are appropriate for the audience and the purpose in mind, it is then good to consider the visualization employed. Do the photographs, drawings, diagrams, and other pictorial materials in the film really visualize the

<sup>1</sup> Filmstrips, Inc., 1307 Sixth Avenue, New York 19, New York.

subject? Do they add something to understanding that words cannot supply as effectively? Do the pictures themselves "speak" to the audience? The pictorial treatment should also make use of the close-up, the medium shot, and the long shot to best advantage. These terms, commonplace in movie terminology, are becoming increasingly common in everyday conversation due largely to the intense interest of

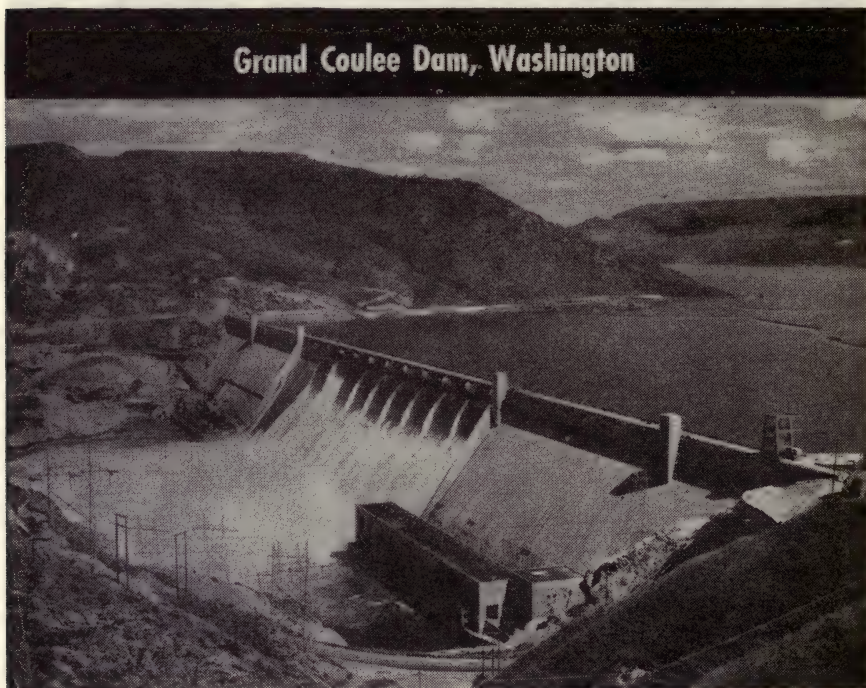


The medium shot and the close-up can be combined on one frame for emphasis. From the "Aircraft Mechanics Series." (*Jam Handy Organization.*)

an army of still and motion-picture photographers. Their importance to the teacher does not require elaborate definition. Although some technicians would argue that the distinction between a close-up and a medium shot should be defined in terms of focal lengths and distances, it is sufficient for the present purpose to be continually alert to the need of bringing the observer close enough to details of the object being presented in a filmstrip. Throughout this book the term "long shot" will be used to refer to those views which show objects in their natural surroundings, visible to a casual observer such as a man looking across the street at a store window. The "medium shot" will apply in situations analogous to a change in viewpoint, which would result if the hypothetical observer crossed the street and stood in front of the window. The "close-up" in this instance would be the direction of attention to a



single article on display. There is no distinction between the close-up and the big close-up, nor are the movie abbreviations (ls, ms, cu, and bcu) employed. The importance of the proper viewing distance is true not only in vocational subjects, where the need for close-ups of minute parts or operations is readily apparent, but also in academic subjects. For instance, in a filmstrip dealing with the regional geography of some area all three should be used for greatest effective visualization. A long shot

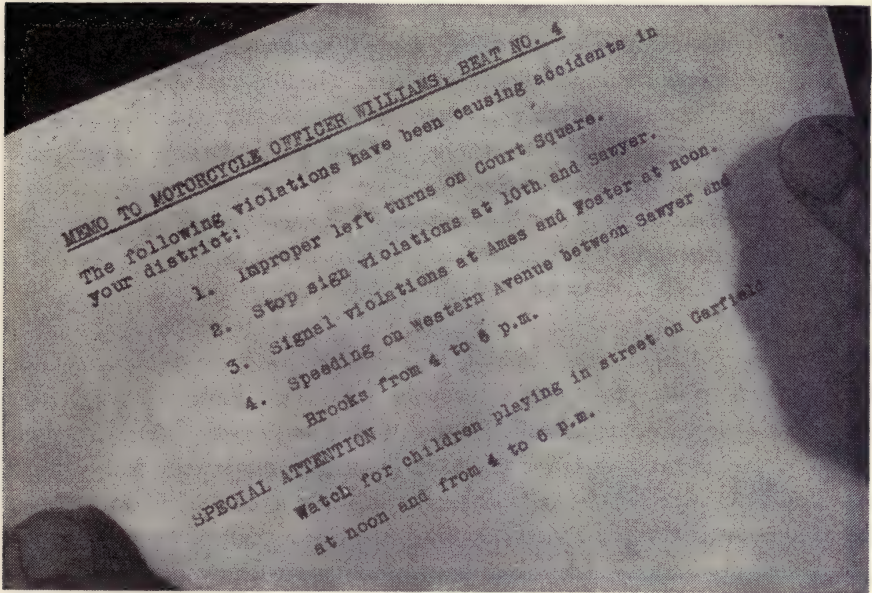


Typical long shot. From filmstrip "Coast to Coast Geography from the Air." (*United Air Lines.*)

might be required to show the over-all appearance of an agricultural valley. The medium shot might be employed to emphasize the appearance of a typical farmyard in the valley; while the close-up could focus attention on points of particular interest, such as the farmer himself, a section of a unique building, or on some product in which the valley farmers specialize.

The organization of the material in the filmstrip is also of importance. A good strip has the facts and ideas organized in a logical sequence that is easy to follow, moving smoothly from one thought to the next. A haphazard collection of pictorial material and text that jumps from one topic to another and then later returns again to the first topic is both distracting and confusing, leaving no vivid impression with

the audience. This need for clarity of organization is easily recognized in strips desired for direct teaching or review, for discussion, or for demonstrations. However, it is just as important in strips for purposes such as illustration. A collection of photographs of the life of an Indian tribe, for example, can illustrate that life much more clearly if properly grouped and arranged. If the pictures show first a view of a dwelling interior, and then one of a hunting party, followed by pictures of



A variation of the text frame. From filmstrip "Selective Enforcement." (*International Association of Chiefs of Police.*)

a tribal dance and individual tribesmen, and again one of part of a dwelling interior such as the sleeping arrangements, the total impression left of that life is slight. But, if the illustrations are arranged in related groups and progress from one activity or aspect of the tribe's mode of life to another smoothly and logically, the impression is clear and details also will remain longer in the memory of the viewers.

The problem of the amount of text contained in a strip is probably dependent to a large extent upon not only the subject matter and the purpose for which it is desired, but also to some extent at least upon the individual user's preference. However, if the strip is to be a visual aid, undoubtedly the pictorial matter should carry the major portion of the information. There is also the superimposed caption versus the text-only frame factor. Both have their uses, and many good strips employ both. If the caption is definitely related to the picture, it probably should appear on the



same frame so that the two will be presented together for greatest effectiveness. The frames carrying only text are necessary for some uses, such as dividing sections or introducing new topics, and are most successful if not too much is crowded into the small space of one frame.

Of course, the technical quality of the filmstrip also has a bearing on its effectiveness as a teaching aid. The photography should be good, in proper focus so that all lines are sharply defined, and should be properly exposed. Overexposed or underexposed pictures lose in teaching value. In black-and-white strips the contrast should be sharp. In color strips, the quality of photography is even more important for proper color reproduction and lack of "fuzziness." The film itself should be in good condition with no scratches, marring stains and blots, or torn places.

Naturally, the information presented in the filmstrip must be accurate and there should be freedom from bias or distortion of facts. If there are two valid sides to a question, the ideal filmstrip should present both. However, a one-sided treatment can be useful in stimulating discussion of both sides if it is made clear prior to the screening that the strip does not present the whole story.

When the right material has been selected, it should be used at the right time, as a definite part of the normal class procedure. Obviously, the filmstrip should be introduced to the viewing group at that time when it can contribute most to the particular topic under consideration. As with all other teaching materials, grade level is of paramount importance. Fortunately filmstrips, particularly those without captions, can more easily be adapted for use in grade levels other than those for which they were intended than any other teaching material. In spite of this ease of adaptation, no teacher should use a filmstrip unless previously convinced that it could be appropriately used at the grade level as well as at the particular stage of instruction reached by the group at the time when the strip is to be introduced.

In selection of filmstrips for primary grades the suitability for that level and its particular requirements is perhaps more important than at any other level, since the instruction received by primary pupils must not only give them factual information but also provide them with a basis for future learning. The interests should be stimulated and directed; good habits for group and individual play and work encouraged; experience and vocabulary broadened; and a readiness for learning established. Well-produced filmstrips can help the primary teacher to meet these objectives, and usually it will be found that filmstrips produced specifically for this level meet the requirements best. Young America Films' "Primary Health" series, for example, stimulates interest in good health and directs these interests toward proper health habits through suitable motivation devices and reasons that appeal to the children themselves. A number of the available strips on different subjects can assist in providing vicarious experience and environmental vocabularies; for

example, Encyclopaedia Britannica Films' "Children of Many Lands" series; Popular Science Publishing Company's "On the Farm With Tom and Susan" series, which deals with elementary science topics; and some of the reading series such as Long FilmSlide Service's "The Home" series and Stillfilm Company's "Primary Reading Set." Material expressly for establishment of learning readiness has been produced recently—the Row, Peterson and Company's "Reading Readiness" series and Popular Science Publishing Company's "Primary Arithmetic" series. In the latter, the first two strips of the series especially assist in development of arithmetic readiness. Individual habits, such as safety and health habits, are dealt with in filmstrips designed definitely for that purpose. However, the filmstrip itself, since it is shown at the front of the room, obtains group attention and aids in the encouragement of group activity. A few of the uncaptioned filmstrips produced primarily for other levels can be used in primary grades, since there is no vocabulary difficulty present and the teacher can use the pictures to illustrate her own comments. A good example of such a strip is the American Council on Education's "Day on the Farm," which pictures one day's activities of a farm family, with considerable emphasis on those of the children.

Since the selection requirements for primary grades are more specialized than those for other levels, filmstrips suitable for this level have been so indicated throughout this book. Definite grade level indications have not been given for other strips in many cases unless specific aspects of the strip place it definitely at one level only. While the primary teacher could search the various subject classification for the indicated primary level strips, the materials produced expressly for those grades are so few that they are listed here.

#### *Sections:*

Reading

Primary and Lower Elementary Social Studies

#### *Series and individual titles:*

Sing a Song of Safety Series

On the Farm With Tom and Susan

In Zooland

Kangaroo Junior Steps Out

The Owl Family

A Visit to the Zoo

A Day with Bobby and Ellen

Primary Health Series

Bending the Twig

Let's Make a Post Office



- Seeing the Airport
- How We Travel on the Train
- It's Fun to Travel by Train
- Life of the Eskimo
- Living In Other Lands Series
- Indian Life
- Life in Colonial America
- Pioneer Days
- Primary Arithmetic Series

Selection of filmstrips for use in the intermediate grades should consider the contributions that filmstrips can make to the special problems of that level. Perhaps one of the major tasks of the teacher in these grades is to satisfy the many divergent requirements of her pupils. Children at this level frequently vary much more in background, previous learning, experiences, and interests than do primary pupils. Filmstrips can assist in the broadening of individual backgrounds and providing vicarious experiences common to the entire group for use as a basis for further class study. They can be useful also as interest stimulators, helping to get the class as a unit ready for the next stage of learning. By the time children have reached this level they are usually able to "read" pictures, gaining an understanding of what a picture means, while earlier they were able to describe only what they actually saw in the picture itself. Therefore, illustrative filmstrips become more meaningful at this level than before and can be used for such purposes as bringing life and reality to the social studies, nature study, geography, and history. Geography filmstrips like the Filmette Company's "Characteristic Landscape Views" series, while illustrative only, will help to motivate and bring more understanding to the study of various lands besides providing the class with opportunities to develop their interpretive abilities. Considerable filmstrip material is currently available in subjects such as economic and industrial geography, nature study, and hygiene, which should permit selection of strips for any specific class. Stillfilm Company's "Wild Animals of the U.S.A." series, for example, provides pictures and general information that can be expanded as required by specific class needs or interests. Young America Films' "Good Health" series approaches the subject of health habits from a point of view which should captivate the interest and elicit the proper response from most children at this level. In language classes, uncaptioned strips can be particularly useful to supply interesting subject matter for oral or written stories, stimulating imagination and providing a springboard for independent thinking and creative expression—for example, the strips produced by the American Council on Education including "Forest Ranger," "Indians of the Southwest," or the "Panorama of

the United States" series can be used for this purpose even though they were originally produced primarily for use at the junior high school level and for other courses. Since the range of interests and learning readiness at this level is large, filmstrips in this book are not generally designated as specifically for the intermediate grades. Also, individual teachers may find that some of the strips indicated as upper elementary material are suitable for their particular groups.

The need for recognition of individual needs carries over, of course, into the upper elementary and junior high school classes; however, perhaps one of the most important factors in selection of filmstrips for these levels is the approach used. These groups are becoming more and more sensitive to what in their opinion is too "childish" or is an attempt to dictate to them. Materials slightly more difficult or mature in approach than their actual readiness indicates may be more acceptable to certain groups than materials which are even slightly below their level of progress and provide a challenge for the class. Of course, ideally the filmstrips used should be at exactly the proper level for the entire class, but with the divergence of abilities in the average class this is impossible of attainment. Considerable material has been produced expressly for these levels, but teachers will probably wish to consider also those designated in this book as elementary and as senior high school materials in order to locate those most suitable for their particular needs. For example, the Jam Handy Organization's "Basic Bird Study" series is suitable for many groups of this age, but may be too elementary for some classes that have a wide background of information on this subject. Devices such as those used in the Popular Science Publishing Company's "All Aboard the Punctuation Express" series approach the subject through general interest of many of these classes and may be found useful particularly in motivation of this topic so often uninteresting to many pupils. Some of Film Publisher's discussional filmstrips, such as "American Counterpoint," while designed primarily for older groups can be used successfully at these levels especially with classes of more mature interests or to assist in development of wider interests.

Very little filmstrip production has been aimed specifically at senior high school and college uses in most academic subjects. This factor, of course, has a bearing on the selection of strips for these levels. Various fields in vocational training—agriculture, machine-shop work, welding, woodworking, and carpentry, for instance—have received considerable attention from filmstrip producers and some variety of selection is possible in these areas. Those strips available for business education—clerical, advertising, salesmanship, and personnel supervision—provide some materials although many were produced expressly for business or industry rather than for classroom situations. Obviously, it will be found that those filmstrips designed for use with adult groups are, at least, not too juvenile for the young men and women of high school and college. This point is important to the acceptance of the



filmstrip by these groups and to the response it will elicit from them. Although interchangeability of instructional materials at these levels is not usually considered a possibility, instructors may find it desirable with some classes (particularly with first-semester or beginning classes) to use filmstrips designed for the preceding instructional level for rapid review or as a refresher. Besides assisting the class members to recall information learned previously, such filmstrip use can aid the instructor in rapid pretesting of a new class to determine the extent of their knowledge background.

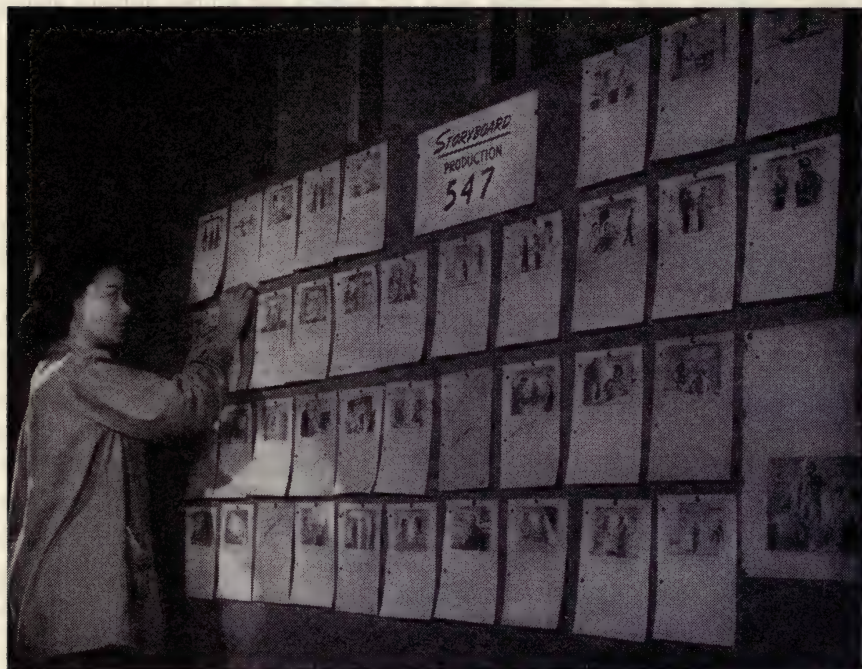
As has been mentioned before, throughout this book specific grade levels are not designated except in cases where levels are not clearly apparent from the subject matter description. In general, arbitrary grade level classifications have been avoided because such classifications are either so broad that they can be criticized as overselling or so narrow that they discourage the teacher from previewing a strip which might be very effectively integrated into a current teaching problem on a grade level not specifically recommended. Indications are given of the range of levels for which vocabulary, treatment and approach, or devices may be suitable in most cases to provide the teacher with some guide in addition to subject matter content which may assist her in narrowing down the number for final consideration and selection. It is more important for the teacher to be sure that the material presented in the filmstrip can contribute forcefully to the subject at hand than it is to worry about arbitrary grade classifications made by someone not cognizant of specific local requirements.

In the same way, abstract evaluation of filmstrips is impossible. No one can do the teacher's job of selection and evaluation in terms of the needs of her own group. Technical quality, visualization, and similar aspects can be evaluated by others, but appropriateness and teaching value of any strip for any specific instructional purpose in a given class situation can be judged accurately only by the teacher herself. There is only one sure way to be confident that a filmstrip serves all the special needs of the local situation and that is to produce it locally.

The criteria for selection, also, can be applied in greater detail when school-produced films are employed. For example, the amount of text photographed for reproduction on the screen can be limited to that considered necessary in the individual teaching situation for which filmstrips are being produced. The opportunities of school-produced films are not only great because they provide a chance for tailor-made material, but also because they give an opportunity for participation on the part of the more intelligent students who might otherwise become impatient with the progress of the class. In addition, filmstrip production usually involves the students who have photography as a hobby. Since these individuals frequently have the more retiring personalities, benefits of filmstrip production activity may accrue to the individual student in a greater degree than it does to the class as a whole. At

the same time, the locally produced filmstrip is likely to stimulate a greater class interest than the filmstrip acquired from an outside source.

The average teacher will immediately object to the excessive cost of "production"; but, before these abstract objections are allowed to disqualify a filmstrip production project it may be appropriate to consider the individual possibilities. For example, if



A story board, similar to this one used in motion-picture production, can be helpful in school production of filmstrips. (*Photo and Sound Productions.*)

the most inexpensive filmstrip technique is employed using camera equipment, etc., already available through the photography club or owned by individual students, it is possible to turn out an effective filmstrip for as little as \$1 if the developing is done by the students, and about \$2.50 if the film processing is done in the local camera store. It will be noted that these costs compare favorably with many of the filmstrip sale prices.

Of course any student-produced filmstrip that relies entirely on student help, available equipment, and local processing facilities may be a little amateurish; but an amateurish, locally produced strip can frequently prove to be a much more effective teaching tool than much of the material currently available for school use. In



addition there is the great added advantage of desirable results that active filmstrip production responsibilities may have for the students who participate.

The simplest type of filmstrip production can be arranged by the use of a simple "copier"<sup>1</sup> employing an inexpensive 35-mm "candid" camera. A simple copier consists of a vertical stand with a sliding clamp that holds the camera above the table surface. Pictures and drawings to be photographed are placed on the horizontal surface, centered under the camera, with the camera the proper distance above to "frame" or mask the material as desired. All the lighting required is two photo flood reflectors, which can be mounted on arms attached to the stand or on separate supports. An enlarger with a copying stand or rack can be used if it is available; otherwise, a copying stand can be built in the school shop. With such equipment, it is possible to photograph various still pictures—in textbooks, magazines, newspapers, booklets, photographs, and simple drawings (preferably white on black which can be executed on an ordinary slate if desired)—as well as appropriate titles which can be hand lettered. If these materials are arranged in the desired sequence, an entire filmstrip can be photographed on a single roll of film, if the length of the strip does not exceed 36 double frames (description of double frame versus single frame given earlier in this chapter).

Procedure for a "copier" filmstrip production is simple, but provides the participating students with a number of worth-while learning experiences in addition to producing a visual presentation keyed directly to a specific situation. The first step, naturally, is the selection of the topic to be visualized. Such selection generally arises out of a need recognized by both the teacher and the class. At the same time, the purpose for which the finished production is to be used is decided. Ideally, at this point a "script" is written, indicating exactly what is to be covered in each frame of the filmstrip—the kind of pictures wanted and the text or captions to be used. The script can be written by the students, using information gathered from many sources. When the script is completed, the proper pictures must be found or drawn. Of course, it is possible to reverse this order. A mass of related pictorial material can be gathered by one student committee while another prepares a preliminary draft of the script, later adjusting the script to the available pictures. If "ready-made" pictures are not found to visualize a specific point, student drawings can fill the gap. In many cases, it may be desirable to have the students prepare drawings for the entire strip, using no other pictorial material.

With the pictures arranged in the order in which they are to appear in the strip,

<sup>1</sup> Photographic copying is discussed in many books on photography. For example, chapter fifteen of "Making Your Photographs Effective" by J. A. Lucas and Beverly Dudley (Whittlesey House, McGraw-Hill Book Company, Inc., New York, 1940) includes complete information on copying apparatus and procedures.

captions and text frames are added where required—of course, the filmstrip can remain uncaptioned if desired. The strip is now ready for “shooting” and the material is photographed in the sequence in which it has been arranged. After developing and the making of a positive transparency, the filmstrip is ready for projection.

In addition to production via the copier, there are a number of other possibilities for school-made filmstrips by direct photography,<sup>1</sup> which requires more work, time, and skill. In such production also the students with photographic hobbies can be the “cameramen,” utilizing all their photographic abilities with more opportunity for creative work than with the copier method. The need for planning the production is even greater with direct photography, to save time, effort, and film. It is usually a good idea to prepare a “shooting script,” which can be merely an outline of the material to be photographed in the order in which it is to appear. With such an outline, the actors, models, props, and other necessary objects can be assembled more quickly and the actual “shooting” done with a minimum of delay. This necessity for detailed planning gives the students who are working on the production experience in organizing the subject matter, which they will have studied carefully to select scenes to be photographed, since a thorough acquaintance with the filmstrip topic is essential for adequate preproduction plans.

“Live action” can be used for filmstrips on many topics. For instance, dramatizations for reading or literature classes can be photographed to illustrate or interpret most tales. Classes in dramatics can make strips on make-up by photographing students as they are being made up, showing the process step by step. Here color adds much to the teaching value of the finished product. Stage sets and scenery-building processes can also be the subject of filmstrips. When planning live-action strips, the outline should indicate clearly exactly what the actors are to be doing and what props and costumes are needed, so that nothing is missing when photographing the scenes. Rehearsal will also be necessary to cut down necessity for retakes. Naturally, if the strip can be so planned and rehearsed that retakes are unnecessary, the entire

<sup>1</sup> Much literature is available on photographic techniques, composition, lighting, graphic design, etc., which can be explored as extensively as the age and grade level of the student producers justify. Filmstrip production can be a creative exercise or a mechanical recording; either activity having great instructional value. The following references are given as examples for those who would achieve a professional-type quality in school produced strips, but the use of such books is not a prerequisite for the production of educationally valuable filmstrips:

Lucas, J. A., and Beverly Dudley, “Making Your Photographs Effective,” Whittlesey House, McGraw-Hill Book Company, Inc., New York, 1940.

Herrschaft, William, and Jacob Deschin, “Lighting Ideas in Photography,” Whittlesey House, McGraw-Hill Book Company, Inc., New York, 1938.

Friend, Leon, and Joseph Hefter, “Graphic Design,” Whittlesey House, McGraw-Hill Book Company, Inc., New York, 1936.



production job is easier, less expensive, and less time consuming because the originally completed negative can be used to make the finished filmstrip without editing.

Table-top models or puppets can also be used, instead of live actors, for the same type of subject matter. Here is an added project for students in the actual designing and making of the models or puppets to be used. Possibilities here, in addition to simulation of live action, are many and the ingenious instructor can adapt this method to many subject matter topics. For instance, table-top models, similar to the salt or sand map, can be constructed for a strip on physical geography. The sand table itself can be used to make strips for elementary social studies—depicting local farm activities, for example. Materials for botany or zoology classes can be made by photographing specimens—either live or preserved.

Various extracurricular activities also offer filmstrip possibilities. Certain plays in football or basketball, for example, can be photographed as a supplementary aid in addition to the diagrams already used. In other sports, such as tennis or archery, techniques of play can also be emphasized in a filmstrip. In addition, it may be desirable to use the filmstrip to record special school events, such as commencement, club activities, or special programs.

The local community also offers filmstrip possibilities. The production of strips about the community, its varied activities and interests, not only results in a useful addition to the school's filmstrip library, but also can be the basis for the participating students to learn more about their own environment and to develop a greater appreciation of it. Class journeys to local factories, stores, scenic spots, or other places can also be recorded in filmstrips. It is often found that students on a class trip do not notice and remember the things they should. Planned picture taking during the journey stresses the important items and the finished production can be used during the follow-up activities. Of course, with the next class in the same course, the filmstrip can be useful as an introduction to the journey.

Another special use for school filmstrip productions exists. The school, its achievements and its needs, can be presented to adult groups of the community—such as the parent-teachers association, the school board, or other interested local organizations. A need for repairs, improvements, new equipment, or materials can be presented graphically and vividly to such groups by using pictures instead of just words. Samples of student's work—from the art classes, the woodworking shop, or results of a detailed project in one of the academic courses—can be photographed and shown to the school patrons to engender more community interest in the school.

If the material, either by the copier method or by direct photography, has been photographed in the order in which it is to appear in the finished strip no editing will be required after the film has been developed and printed. However, editing is

possible by using a 35-mm splicer, which can sometimes be borrowed from the local motion-picture theater.<sup>1</sup> Sometimes, particularly with live action, it is considered simpler to photograph all scenes using the same settings, actors, and props at the same time whether they are to appear in that order or not. If this procedure is followed, editing will be necessary.

Once the photography has been completed, there are a number of substitute methods by which the material can be presented. Eight-by-ten glossy prints can be made for use on bulletin boards or in any other display. These prints of course are more expensive than the filmstrip itself. Also, there is a problem in proper storage. The strip can also be cut up and framed as slides—either 2 by 2 or the standard 3¼ by 4. With the larger size, more expense is again involved, and since glass is used, the finished product is breakable. Both types of slide collections present other problems that should be considered before slides are prepared. Slides get out of proper order easily and must be checked for sequence before each use; also, single slides may become misplaced or lost, leaving a gap in the presentation. Naturally, slides need considerable storage space and require special facilities such as frames or boxes.

While these are alternate possibilities, the filmstrip may prove to be the most practicable for school-produced materials. The filmstrip retains the photographs in the same order at all times and is always ready for use. Duplicate negatives can be made at a nominal cost to preserve the production and to make copies available to others. The storage space required is negligible and no special arrangements are necessary since the container, furnished when the strip is processed or purchased, protects the strip itself. Racks for holding filmstrips can be made (the average school shop can make one easily) or a steel cabinet can be purchased, but such storage racks are not an absolute necessity, although they are helpful if a large number (more than one hundred) of strips is to be stored. Less than this number can be kept in a drawer or a box—25 strips can be easily stored in a box 7 by 7 by 2 inches. Filmstrip titles are generally on the top of the container, and if the strips are stored so that these are visible individual strips can be found rapidly when needed. The only precaution needed to prolong the life of a filmstrip is to wrap a small piece of camphor gum in paper and place it in the box with the strips. This helps to keep the film from brittleness, which may cause cracks.

<sup>1</sup> If a motion-picture splicer is used, it is important to use either "all-purpose" cement or the film cement especially designed for use with acetate film. The majority of 35-mm splicing is done with a film cement that can be used only with the nitrate (highly flammable) base film used in most theatrical film releases.



# Using the Filmstrip

Generally directions for the classroom use of filmstrips include the following instructions: (1) Preview the filmstrip and prepare the lesson; (2) present the filmstrip; (3) follow up the showing; and (4) show the filmstrip again if necessary. These four steps may be given as simply as above or may be elaborated by the addition of details until they are something like the outline given below:

## PREPARATION

1. Lesson
  - a.* Select the filmstrip.
  - b.* Preview the filmstrip.
  - c.* Study the accompanying manuals or guides.
  - d.* Prepare introductory remarks.
  - e.* Plan entire lesson.
2. Class
  - a.* Introduce the film.
  - b.* Arouse interest in the filmstrip.

## PRESENTATION

1. Pretest.
2. First showing.
3. Posttest.
4. Discussion.
5. Application.
6. Additional showings as needed.

## APPLICATION

1. Contribution to lesson explained or discussed.
2. Practical application.
3. Learning activities.
4. Relation to next lesson.

The four steps, either in their simplest form or in the lengthy detailed form, do not really differ from the usual procedure followed by teachers for any lesson, whether or not they are using a filmstrip. Of course, the experienced teacher may not go through some of the detail consciously, but nevertheless the "stages of in-

struction" (from preparation by the instructor, through presentation, application, and examination, to follow-up or discussion) are always present. The preview of the filmstrip, for instance, can be compared with the need for the teacher's acquaintance with any materials—maps, models, laboratory equipment, the textbook, reference books, and anything else being used for instruction. Since this is true, it is readily apparent that there is no special trick to using the filmstrip in teaching; it is used in exactly the same manner in which the effective teacher uses any materials. This chapter provides some examples of ways in which filmstrips have been used for various classroom purposes, with a few reminders of methods which can be most effectively applied to the use of this medium.

Perhaps greatest benefit can be derived from the filmstrip if maximum active student participation is gained. One approach to such participation is by allowing class members to do the projection and to attend to all details concerning the physical setup of the classroom for showings. The filmstrip projector is so simple that even pupils at the elementary school level can operate it properly. Arranging the classroom can also be simple enough for these pupils to do. They can set up the projector and screen before class time, with the strip to be shown threaded and properly focused. They can darken the room at the proper time, provide adequate ventilation, and rearrange the seats if this is necessary. The pupil or student in charge of the projection will necessarily be alert and listening to any accompanying remarks or lecture so that he will know when to change the picture on the screen. Others will be attentive if only to check on their classmate's ability as projectionist.

Students can also be active in the selection of filmstrips to be shown. If preview prints are available, class committees can study these and make recommendations as to the ones that they feel would most benefit the entire class. If such prints are not available, the student committees can make selections from available descriptions or catalogues. Of course, the instructor would have the final decision, but the class members could be made to feel that they had made a real contribution to the actual selection made. Student-selected strips often meet with readier acceptance and interest, attention for the filmstrip showing being already motivated at least in part. The need for active class participation in any filmstrip use cannot be too strongly emphasized and specific methods will be suggested in connection with the various utilization examples discussed.

Certain procedures apply equally to filmstrip use for the majority of instructional purposes. Proper selection is naturally the first important step in using filmstrips and has been discussed in detail under *What Are Filmstrips?* Naturally, the strip should be one which has definite value in relation to the topic of the lesson in which it is to be used. Not only the teacher but also the class should understand this relationship. Therefore, the strip should be properly introduced and its purpose ex-



plained. For example, if the instructor wishes to use a film for illustration of examples showing applications of a scientific principle, the class should be reminded of the principle and told why examples are being shown. In some situations at this time it might be well to indicate exactly how the principle is applied in one of the examples to be shown so that the class will know what to expect from the strip itself. The introduction should also include clear directions as to what the group should look for in the film and what the instructor wants them to get from it. This can be done in several ways. The instructor can give the points verbally, expecting the group to keep them in mind during the showing. Verbal instructions are usually sufficient for older groups or if only one or two specific items are to be gleaned from the showing. However, with pupils at the elementary level or with strips from which considerable information is to be learned, other methods may prove more satisfactory. An outline or questions may be written on the blackboard and explained during the introduction. Or, such outlines or questions can be mimeographed in advance so that each class member has a copy. This latter method is preferable in cases when this same material is desired for follow-up activities. Seeing the written words assists the class to recall the points during the showing itself, even though the blackboard or mimeographed material cannot always be referred to while the room is darkened. Of course, both written instructions are particularly useful if daylight projection is used, since the students can refer to them whenever necessary during the screening. If a quiz is to follow the screening, the introduction might warn the class that certain questions will be asked. The introduction itself, however, should be brief, probably not more than 5 minutes. Although the above discussion may seem to indicate a complicated process, the content of an introduction can be summarized as stating (1) what the filmstrip is about and how it relates to the topic being studied; (2) why it is being shown; (3) what the class should get from it; and (4) warning of a test or quiz if one is to be given. A good short introduction helps to arouse interest in the strip and gains attention for its content.

As was suggested in the discussion of selection procedure, use of a filmstrip should be a purposeful activity with the filmstrip selected and shown for a specific purpose that is clear to both instructor and class. Merely showing a strip because it is available is of no more teaching value than telling the class to use the encyclopedia just because it is in the school library—strips as well as encyclopedias are presented to the class for clearly defined purposes. If the film is being shown as an integral part of a review lesson, for example, its relation to other review procedures should be made clear. Also, its use by the class and by the instructor should be restricted to its review values.

Just as is done during the presentation of subject matter by any method, class questions and discussion should be encouraged during the actual showing of the

filmstrip. This is possible with silent strips, but of course cannot be done during the screening of a sound strip. If the pupils do not understand the information as presented in a single frame or in a sequence, or want additional information, their questions can be most satisfactorily answered at the time when they arise in the pupil's mind and while the pictorial or text material of the strip is still on the screen. It is one of the advantages of the filmstrip medium that each frame can be held in



## What is the SAFETY HAZARD here?

Example of one device for encouraging student discussion during the filmstrip showing. From filmstrip "Safety in the Home." (Young America Films, Inc.)

view as long as is desired. Class discussion on any point in the strip can be developed at any time during the showing. Often the projected material arouses interest in a specific topic that might be lost to some degree, at least, if discussion is postponed until after the showing. Some filmstrips, particularly the more recent productions, make provision for student participation by posing questions that can be used to develop lively class discussions. The instructor can also encourage such discussion with her own questions if the students do not spontaneously desire to amplify a particular topic being shown. At times it may be found that the discussion and amplification of information becomes of such interest and value to the class that it is desirable to continue it for some length of time before resuming the showing of the strip. In this case, it is a simple matter to turn off the projector, leaving the strip just



as it is. When the animated discussion is completed, the filmstrip screening can be resumed at exactly the same place. If the previous discussion covered some of the material shown in the rest of the film, the relationship can be pointed out. Such a brief pictorial review assists the class in understanding and retaining the information gathered from both the film and the discussion.

Since the filmstrip can be an elastic medium, it is usually well to plan its use during the first half of the class period so that the pressure of time will not preclude discussion or questions. Furthermore, its timing should be such that enough class time remains after the showing for what are usually called the follow-up activities. Of course, these activities may be of such a nature that more time is needed to develop them completely, but some part of the follow-up should come immediately after the showing for greatest effectiveness—for example, additional class questions or discussion, assignments of related projects or reports, tests or quizzes on the strip itself, and similar activities.

The follow-up of a filmstrip can take many forms, depending of course upon the subject matter, purpose for which it was used, and type of strip. Tests or short quizzes on the content of the filmstrip itself are one part of follow-up, and may be given in either oral or written form. Tests are generally useful with strips from which considerable factual information is to be retained by the class. Or, in elementary grades particularly, a comprehension test is often valuable after the screening of a strip designed for supplementary reading. Sometimes it is desirable to present questions, not in the form of a test but as an assignment for the class to complete both from memory of the film's information and from textbooks or references. Such questions, either on the blackboard or mimeographed, can be of the type mentioned in the discussion of the introduction of a strip prior to the showing. Or, they may be presented after the showing as an assignment. The questions may be confined to the film's content, or may require amplification through study of textbooks, reference books, or current publications. With this type of question sheet, specific textbook or reference reading assignments can be given and the relationship of new material to the filmstrip pointed out. For instance, if a filmstrip on the life of George Washington has been presented as an introduction to a unit in an elementary history class, the question sheet could test retention of information presented by the film and present inquiries concerning other aspects of Washington's life or activities to be found in textbook assignments or reference books.

With filmstrips demonstrating skills the follow-up is generally either an actual demonstration of the skill or a practical application. A strip that presents the fundamentals of lathe operation to a woodworking class leads directly to an introduction of the lathe itself and assignment of specific operations to be performed. Of course, the test or question sheet is sometimes applicable here also. A strip demonstrating a

skill such as the use of the slide rule can well be followed by assignments of problems for solution by the class.

In some classes, themes or oral compositions are natural developments of the filmstrip. Again, the topics of the compositions can be confined to the strip itself or can concern related material. In either case, however, the filmstrip can motivate interest in theme topics. Such compositions can be assigned after the entire strip has been shown. In some classes, the students can select their own topics, choosing those in which most individual interest has been aroused. Another method for filmstrip composition is to project one frame or a brief sequence and have the class compose short written compositions during the class period. These can be discussed immediately, or assigned for expansion later when the class has time to do additional reading. Extemporaneous oral compositions, too, can grow out of the "one-frame" show. Talks of this nature can be based on frames in a filmstrip new to the class or on frames in a strip previously screened in entirety. In the latter case, the oral composition work could be assigned after the screening to permit planning of talks and gathering of additional information, the talks to be given the following day as the selected frames are again projected. Using a filmstrip as a basis for compositions helps to provide stimulating topics, especially for language and English classes, and avoids the assignment of such topics as "What I Did During Vacation," which are all too often uninteresting to the class.

In certain subjects and particularly in the lower elementary grades, drawing or painting, clay modeling, or similar creative activities can be based on the filmstrip. These activities may grow out of the showing of an entire strip and be used as a follow-up with each child making a picture or object related to the strip itself. Or, groups can work together reproducing the filmstrip on long rolls of paper, either while it is being shown or following its showing. With older children, the paper filmstrip might take the form of original strips on related topics. With a project of this type, small groups can be assigned to work on a topic together, preparing not only the paper filmstrip but also a related report.

The follow-up report is adaptable at any age level and in every type of class. There are perhaps three major types of reports that can develop from a filmstrip showing. One type is a report which amplifies the information given in the filmstrip and which can be directly related to the class discussion during or following the screening. For instance, if a strip on air transportation has been shown that gives a general survey of many aspects of an air journey, individual amplifying reports could be given on those aspects of most interest to the class, and might include such topics as how meals are served on a plane; what the duties of a stewardess are; what other crew members are carried and what their duties are; what types of planes are used for different types of transport; or what ground personnel is



required and what each contributes to the success of each flight. More technical topics might be included with older groups or if the younger groups evince an interest in them. Such a report provides an opportunity for considerable research and additional reading. However, if an incentive for research and reference reading is desired, the other types of reports may prove more effective.

Reports on related material can lead class members into exhaustive search of all possible sources, particularly if the individual topics have been suggested and selected by the students themselves. With the same strip which was used as an example above, related topics might include the technical phases which had not been covered in the strip itself, other uses of airplanes such as the dusting of fields with insecticides or for dropping men and supplies for fighting forest fires, vocational information on how one becomes a stewardess or pilot or mechanic, and the requirements for such vocations. The reports can go further afield and concern other methods of transportation, comparing them as to speed, uses, areas served, etc. If the need for student participation is fully recognized, any topic that in the mind of the student himself is related to the strip or to the lesson being studied can well be the basis for a report. The filmstrip stimulates interest and motivates and prolongs study, research, or discussion. This has a direct bearing on the selection of the report topic, since the best reports based on the most careful study and research grow out of those topics of greatest interest to the student making the report.

The third type of report is one based upon another filmstrip that deals with related material. This can be either individual or group activity. The students preparing such a report study the pictures carefully, doing reference reading as needed to give complete information about each picture. All the gathered material can then be prepared as "script," keyed directly to the frames of the filmstrip. The group, or the individual, will then present the strip and the information to the class, taking charge of the projection details and of discussion or questions. Naturally, the other members of the class will be attentive, possibly taking notes on the pictures or on the information given in the script, so that they can question the reporting students. Of course, this is usually done with the hope of tripping up or catching the student on something he doesn't know, but if this is recognized and the questioning unobtrusively guided, it results instead in well-motivated, interested, and active learning. If a group has prepared such a report, each member of that group should contribute something to the actual presentation, taking an active part in the discussions and in the answering of class questions. These students might also prepare a brief quiz or a question sheet for the class. In this case, the reporting group can correct the resulting papers themselves, prior to a final check by the instructor. With a report of this nature, sometimes it is well for the strip to be

shown again the following day and the phases not fully understood further explained by the teacher.

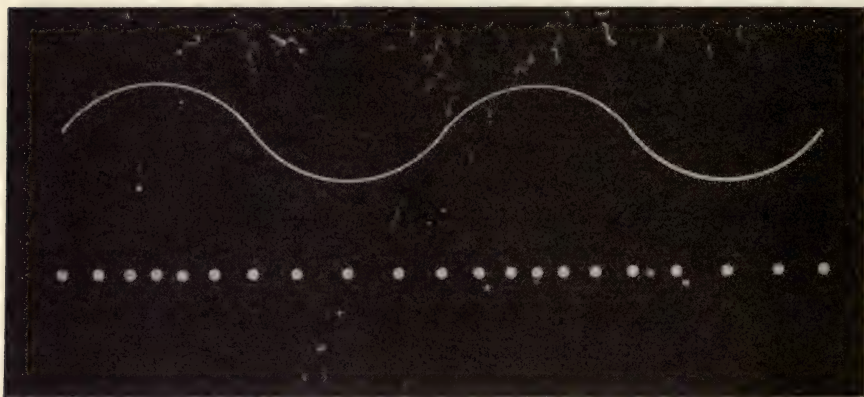
In some subjects a school journey may grow out of the filmstrip showing. Generally this, of course, is planned in advance by the instructor as the follow-up to be used; however, sometimes the instructor has not specifically planned for such a journey but finds that the filmstrip has aroused an interest in some topic which can best be further treated by one. Filmstrip uses that most often result in class trips include (1) filmstrips used to introduce a unit, and (2) school-produced strips. If the unit introduced by the film contains the possibility of a journey, it may be that pupil interest following the screening will turn immediately to such an activity. Since the interest is there, perhaps it would be well to have the journey at this point in the unit rather than postponing it. This situation may arise, for instance, in a unit on milk production and distribution, which has been introduced by a strip giving an overview of milk from field to home. If the local community has a creamery or a milk-processing plant, the interest of the students may focus upon this and a journey results to amplify information gained from the strip while the desire to learn is still present. As was mentioned in the discussion of school-produced filmstrips, the local community and school journeys can result in the production of strips. If such a strip has been made, it can be used in subsequent classes for the express purpose of motivating the journey and stressing the things that the class should observe.

Another general procedure for gaining as much value as possible from a filmstrip is referring to it during the development of the unit of study of which the filmstrip is a part. The material gained from the screening should be recalled frequently during the other activities, and the information related to new points as these are being presented. The teacher brings in, at appropriate times, references to previous textbook assignments, to class discussions, to information gained from maps, supplementary or reference reading, and all other class activities. In the same way, whenever the pictures of the filmstrip have a bearing upon new lessons within the unit, they should be called to mind. Of course, if desired, the particular frames or sequences can be shown again. Referring to the strip throughout the unit and during the review of the unit helps to gain from it the greatest possible learning values.

The filmstrip, too, like all teaching materials, should be used together with other aids and tools. One method of using the blackboard together with the filmstrip has already been mentioned—blackboard outlines or questions on the strip itself. However, written or drawn material of many kinds can be placed on the blackboard for use in conjunction with the filmstrip or its follow-up. Related outline maps, graphs, or problems on the blackboard can be referred to whenever appropriate



during the screening. This use is of particular assistance when certain points need clarification or amplification. Sometimes it is desirable to hold a diagram or drawing that appears in the film before the class for several lessons. No matter how complicated the drawing desired for this purpose, it can easily be reproduced by projecting the selected frame on the blackboard and tracing it with chalk. In such blackboard reproduction, additional material can be added by the instructor if desired. For instance in a diagram showing the circulation of the blood in the body, the instructor may wish to use red and blue chalk to emphasize the venous and arterial



The proper spacing of the dots as shown in this filmstrip frame can be used as an easy guide for blackboard illustration. From filmstrip "Sound." (*General Electric Co.*)

systems. In a later lesson, the location of digestive organs may be indicated on the diagram when the class is studying the absorption of food.

Still pictures, such as photographs or tear sheets from periodicals, and class drawings may be used to emphasize specific phases of the lesson or unit touched upon in the filmstrip. These can be displayed prior to the screening and called to the attention of the class during the introduction to the filmstrip as a part of the explanation of what is to be learned from the strip. The same pictures or drawings can be used during the discussion of the strip or in later lessons to assist in recalling information learned. Other uses may involve comparisons. For instance, a strip on coal-mining methods in Great Britain has been shown to a geography class. Still pictures showing methods used in the United States would point out differences and similarities.

The bulletin board can be used for many other related materials, which should be referred to prior to or after the filmstrip screening and their relationship and purpose pointed out. Reading lists, graphs (particularly those which bring filmstrip-

given statistics up to date) or material such as a copy of the Declaration of Independence for use with a filmstrip on the same subject—these and others are useful with filmstrips as well as with textbook assignments.

Wall maps and globes also can be used to locate the areas discussed in the strip, either prior to or after the showing. The routes of explorers or of characters in stories can be traced. The understanding of distances can be clarified. Wall charts of many types may be useful in the same manner as blackboard drawings or still pictures. A chart showing a coffee plantation might be useful in connection with a strip on Brazil that does not provide sufficient pictorial material on this subject. A manufacturer's chart of a storage battery could be profitably used with a film on the same topic.

If a slide collection is available, the instructor may wish to use some of them with the filmstrip. For instance, in history of art or art appreciation classes, the strip used may not include some of the same examples as are available on slides. It may be desirable to expand the number of examples shown by presenting some of the slides. Or the slides may be used to draw comparisons. For instance, a filmstrip showing European cathedrals is being shown. The school slide collection contains some slides showing cathedrals and churches in the United States that use similar architectural detail, copied from a European original. The slide may be projected at the same time as the related frame in the filmstrip. While both pictures are held on the screen, the differences and similarities can be pointed out. Two filmstrips may also be used for purposes of comparison. This may be done by projecting them one after the other, but if sufficient equipment is available it may be highly desirable to operate two projectors simultaneously.

Naturally, the textbook and reference books are used in conjunction with the filmstrip whenever assignments in either are made as part of the follow-up. However, there are other possibilities. The modern textbook is often well illustrated and the relationship between textbook and filmstrip illustration should be brought to the attention of the class. This is particularly true with the more recent filmstrip productions, for they sometimes present a more up-to-date illustration of the same subject as is shown in the textbook. Here differences, developments, additions, and other points of progress or change can be discussed. With reference book assignments definite sequences of a filmstrip seen by the entire class can be used as the focal point for further research and study. Or a strip that has not been seen during class time may be included in the assignment for individual viewing to assist in understanding of the subject covered in the reading assignment.

When visual materials are available that have been designed specifically to accompany certain textbooks, the correlation of textbook and visual aids should be easier for the instructor and more readily apparent to the students, thus providing



even greater assistance in the learning process. There is such a program underway, using motion pictures with review-type filmstrips, for the following texts: Diehl's "Textbook of Healthful Living,"<sup>1</sup> French and Svensen's "Mechanical Drawing,"<sup>2</sup> French's "Engineering Drawing,"<sup>3</sup> and Schorling's "Student Teaching."<sup>4</sup> These motion-picture filmstrip units are being planned in collaboration with the authors of the textbooks to provide as close a correlation as possible between text and visual aids, and, as much assistance as possible to the instructor using the textbook. Filmstrip units correlated with specific textbooks are being produced for Mavor's "General Biology,"<sup>5</sup> for the "Alice and Jerry" reading books,<sup>6</sup> and for the unit texts of the Basic Science Education Series.<sup>7</sup> Another type of visual treatment, using illustrations from the textbook, is employed in filmstrips to accompany Masson's "Physics Made Easy," "General Science Made Easy," and "Chemistry Made Easy."<sup>8</sup> Still another approach to textbook-visual aids correlation is being done by selecting existing motion pictures and filmstrips for particular textbooks. This has been done for the Whitman-Peck "Physics."<sup>9</sup>

Even though a strip on a given academic subject was not produced in collaboration with the author of a particular textbook, the author of the book and the producer of the filmstrip faced the same problem in selecting illustrations. That problem is fundamental in the presentation of any subject matter. It is the difficulty of visualizing specific topics. Too often it has been necessary to use an inadequate symbol as an illustration rather than an actual visualization. For example, a photograph of Boulder Dam is sometimes used to demonstrate water power, or a picture-postcard view to illustrate points in geography. Actually neither is very helpful unless it is tied into other pictures showing how the water pressure behind Boulder Dam is used to generate water power, or the scenic view is supple-

<sup>1</sup> DIEHL, HAROLD SHEELEY, "Textbook of Healthful Living," McGraw-Hill Book Company, Inc., New York, 1940.

<sup>2</sup> FRENCH, THOMAS EWING, and CARL LARS SVENSEN, "Mechanical Drawing," McGraw-Hill Book Company, Inc., New York, 1940.

<sup>3</sup> FRENCH, THOMAS EWING, "Engineering Drawing," McGraw-Hill Book Company, Inc., New York, 1941.

<sup>4</sup> SCHORLING, RALEIGH, "Student Teaching," McGraw-Hill Book Company, Inc., New York, 1940.

<sup>5</sup> MAVOR, JAMES W., "General Biology," The Macmillan Company, New York, 1941.

<sup>6</sup> O'DONNELL, MABEL, and ALICE CAREY, "The Alice and Jerry Books," Row, Peterson and Company, Evanston, Ill., 1936-1947.

<sup>7</sup> PARKER, BERTHA MORRIS, and GLENN BLOUGH, "Basic Science Education Series," Row, Peterson and Company, Evanston, Ill., 1941-1947.

<sup>8</sup> MASSON, LOUIS T., "Physics Made Easy, General Science Made Easy, Chemistry Made Easy," School Science Press, Buffalo, N. Y.

<sup>9</sup> WHITMAN, WALTER G., and A. P. PECK, "Physics," American Book Company, New York, 1946.

mented with detailed photographs demonstrating the geographical principles being discussed. The more abstract the idea to be presented, the more difficulty is encountered in visualizing it. However, the same problem is encountered in illustrating topics that appear simple to present pictorially. At first thought, it may seem an easy matter to illustrate with a photograph the highly pictorial topic of inland water transportation. But, if one considers the number of pictorial possibilities, it is readily apparent that no one picture, or indeed no small group of pictures, can present an adequate visual concept of the topic. Examples, either historical or modern, can be provided; but, the drama, the significance, and the interrelationships with other phases of economic life cannot be captured easily in a few illustrations.

The fundamental problem of selecting visual ideas to illustrate common areas of instruction has been solved by some textbook authors in some parts of their subject matter. The filmstrip may solve the problem for other parts of the subject matter treated in the textbook. Therefore, the first step in planning filmstrip use is to analyze the text to see which areas need outside visual assistance most, and correlate filmstrip with text illustrations. In some cases it will be found that a certain picture appears in both textbook and filmstrip. This pictorial repetition, instead of being undesirable, can be used profitably to expand the learning experience.

Use of the filmstrip together with a motion picture has been mentioned before in the chapter *What Are Filmstrips?* As was there indicated, a number of producers of visual materials are designing filmstrips expressly for that purpose. Some of these strips, like those produced by the U. S. Office of Education, are organized specifically for review purposes, to follow the motion picture and emphasize important points. Others use an approach that makes the filmstrip independent of the motion picture, usable either with it or without it. For example, the *Encyclopaedia Britannica Films'* strips are self-sufficient and can be valuable aids without the motion picture. However, they have an additional value when used with the motion picture. Often it is desirable to let a class see a motion picture more than once in order that fullest learning may derive from it. This, naturally, consumes considerable class time, even when the movie is brief. Filmstrips of the type produced by *Encyclopaedia Britannica Films* eliminate the necessity for subsequent showings of the motion picture itself, since they summarize all the important points. Furthermore, these particular filmstrips contain devices for student participation and to encourage discussion. This also assists in both the completest possible recollection of the motion picture, if it has been shown, and in the use of the strip without the movie. Another approach in the independent filmstrip has been used by *Young America Films*. This producer aims to design strips that will supplement



the motion picture and also to provide additional filmstrips in the same area, not based on a motion picture, for use in carrying discussion further, without necessarily repeating the same visual devices.

The filmstrip produced for use with a specific motion picture can of course be used for review of the movie, but it has other applications also. It may be used prior to the screening of the motion picture to help the class to find in the movie those points which they should particularly note. It may be used as a focus for the follow-up discussion. A few of the self-sufficient filmstrips based upon motion pictures present an entirely different point of view from that of the movie or provide additional information. An example of this is Film Publishers' "Man—One Family," which is based upon the motion picture of the same title (a British Information Service film). This strip is designed to bring the information to the local groups and to relate it more directly to conditions in the United States—the original motion picture was planned for a world-wide audience.

However, the instructor is not restricted only to those filmstrips expressly designed for the purpose when he wishes to use a strip with a motion picture. He can select and use any of the available filmstrips that will fit the purpose in mind. Sometimes a motion picture shown in a particular class covers a great deal of information, possibly giving an overview of an entire unit. In this case, the instructor may wish to take up for further study one small phase at a time. It is here that a filmstrip can assist in relating the detailed study to the information gained from the motion picture. The same kind of use applies, and to even greater extent, with motion pictures that have been shown in the auditorium. Let us suppose that a feature-length movie on the life of the Eskimo has been shown to the entire school during an auditorium program. It is possible to find related filmstrips for a number of the different classes, pointing out and emphasizing phases most pertinent to the subject matter of each. Nature study classes could see a filmstrip showing the animals of the northland; social studies groups, a strip on the life of the Eskimo, or on their hunting methods; a class studying transportation, a strip showing the advantages of the airplane in negotiating areas in the frigid zones; strips on the geography of Alaska or northern Canada or Greenland could be utilized where pertinent. The interest aroused by the motion picture can be carried over through the filmstrip to the subject matter being studied by each class, besides emphasizing and expanding whatever was learned from the movie itself.

While the above procedures are merely adaptations of methods used in presentation of subject matter through any other medium, there are a few utilization techniques that are unique to the filmstrip. It is possible to improve the organization of a filmstrip, or to adapt it more completely to class needs, by the method of showing it. If the strip contains some sequences that are not of importance to the

class at the present time, these can be projected rapidly and those sequences requiring emphasis projected slowly while discussion on each frame takes place or while a lecture is being given. The same applies to strips which contain more text frames than required for the class, or text frames which do not make the points which the teacher wishes made in connection with the pictorial content. The text frames can be clicked rapidly through the projector, while the instructor explains why they are being omitted. This cannot be done with motion pictures and is often difficult to do with materials such as the textbook. It may occur to the teacher from the above discussion that filmstrip frames may be shown in any sequence desired. While this is possible physically, it may be found that too much reorganization through projection is confusing to the class. Minor adjustments, such as omission of frames or rapid projection of sequences, retain smoothness of presentation if done skillfully. However, if much reorganization seems necessary to adapt a strip to the desired purpose, it is probably wiser instead to select another.

With the filmstrip it is also possible to turn back, during the showing, to earlier frames or sequences. This may be done to show relationship between knowledge already presented and a new idea, or to clarify a point in answer to a student question that may arise during the showing or in discussion. For instance, it may be desirable with a biology filmstrip dealing with reproduction to refer back to the sequence showing cell division to assist in the understanding of the development of the fertilized ovum presented later in the strip. Of course, such referrals to previous material are possible with textbooks and reference books although the teacher cannot be certain that all the students have turned back to the correct page; but, with the motion picture this cannot be done.

It is also possible, and many times desirable, to use only selected sequences<sup>1</sup> or to start the showing elsewhere than at the beginning of the strip. Some strips contain much material, which if discussed fully in one class period could not be completely assimilated by the class. In this case, only the sequence or sequences pertinent to the particular day's lesson are used whether they occur at the beginning of the strip or in the middle of it. Perhaps a strip dealing with a certain country contains both geographical and historical sequences, opening with the geographical data. The instructor of world history may wish to use that particular strip for its historical content, but not wish to use the other information. With the filmstrip, it is simple to start the showing with the historical sequence, omitting the earlier

<sup>1</sup> As emphasized by Harry C. McKown and Alvin B. Roberts in "Audio-Visual Aid to Instruction" (McGraw-Hill Book Company, Inc., New York, 1940, p. 142), "Many teachers make the mistake of presenting too many slides or pictures from the strip at one time or in one period. . . . The test of good picture teaching is not to be found in the number of prints displayed but in the extent to which those that are shown are really learned. Studying a few carefully selected pertinent pictures is much more valuable than merely looking at a greater number."



geographical material. Also, particularly with the long filmstrips containing much information, it may be a good idea to present the strip in several showings, using sequences only at the times when they are definitely related to the subject matter being presented through other media. Some strips of this nature can provide brief showings for three or four lessons. Of course, in this case, the entire strip may be shown later as a review.

The utilization procedures described above can be applied when using filmstrips for demonstrations of skills, direct teaching, review, introduction of new units, motivation, illustration, discussion, and other supplementary purposes. However, additional methods and particular adaptations of the general procedures can help in most fully meeting each purpose.

The previous discussion has already suggested follow-up of skill demonstration strips by actual demonstration or practice. Such strips are generally of greatest use as a supplement to actual practice, because they make it possible to show small or hidden parts, methods of handling small tools, and similar material to a large group at once. Therefore, the instructor using such a strip would probably dwell upon particular frames, pointing out the small units to be observed later in the demonstration, or the difficult-to-see techniques of operation to be employed in later practice, or things which cannot be seen without a microscope. With the strips used for these purposes, blackboard reproduction is often desirable to keep certain important diagrams or sectional views before the class as they practice the skill demonstrated. It may be found that individual students wish to refer again to the strip as they proceed with their work to clarify some point not remembered completely. For this purpose, in well-made strips that do not contain too much text or overcomplicated drawings, projection is not necessary. The student can look at the filmstrip through his fingers, holding the film between his eyes and the light.

If a filmstrip is wanted for use in introducing a new unit of study, its proper selection is of great importance, for it must not only aid in presenting the new material but should assist in motivation. Utilization of a filmstrip for introductory purposes differs little from the use of any material for the same purpose. However, its relationship to the entire unit and to the next day's lesson should be made clear. Here the filmstrip can best serve in pointing out pupil interests. The discussion during and following the showing of the strip will indicate to the teacher which phases of the unit hold greatest interest for the class or for individuals. The rest of the necessary information in the unit can then be related to these interests and developed from them.

A filmstrip being used as part of direct teaching, or presentation of a particular lesson, can serve several specific purposes. It may be used to clarify and expand

subject matter presented by other methods, or help to clinch essential facts, or to provide a substitute for firsthand experiences. One procedure for using a strip for these purposes is to present the strip as an integral part of the instructor's lecture, with the information organized so as to be keyed to the frames of the strip. This of course requires complete familiarity by the teacher so that the class can be led from frame to frame and from sequence to sequence without omission of necessary information by lecture. With some practice, a lecture with a filmstrip is as easy to organize as a lecture without one and can be of greater interest to the students. It is in this type of utilization that the need for student participation is sometimes forgotten. Time for questions and discussion during the showing should be included in planning such a filmstrip lecture if at all possible. And, if spontaneous questioning does not arise, the teacher can start discussions by questioning the class herself, just as she would do when giving a lecture without a filmstrip, to emphasize important points and to be sure that the class is alert and receptive.

Several methods may be employed in using filmstrips during review. Of course, any filmstrips used for other purposes during the study of the unit can be screened again to recall for the class the information learned from them previously. The review can be simply a rapid reshowing, but this can be amplified by such devices as oral quizzing as the film is shown, or rapid drill in subjects where this is possible. Another use of the previously studied strip is one which can be of great interest to the class, but which generally takes more time. The review strip can be used as a "memory game," showing only the first frames or some brief selected sequence from any part of the strip and then requiring the class to recall the information given in the rest of the strip. Such a procedure also helps the class to verbalize the data learned. This particular aspect of the use of visual aids cannot be overemphasized, since the use of a filmstrip or other visual device may give the student momentary comprehension and retention without enabling him to verbalize and transmit to others what he has learned. While it is valuable to have information in visual terms, it cannot usually be turned to productive ends unless it can be put into words. Without this ability, the student will find it difficult to use his knowledge, thus defeating the purpose of the education he has received. Sometimes, with the filmstrip memory game, it is desirable to show the entire strip rapidly after the class has recalled as much of the strip as they can, stopping only to emphasize any important points missed previously. It is also possible to use for review purposes filmstrips which are new to the class, allowing them to relate the new pictorial material to the unit of study. This provides not only a review of the information already learned, but also a new application. The student generally remembers longer and more vividly knowledge that he has used. The use of new filmstrips is particularly applicable in reviews of skills. For example, a



woodworking shop class has not used any filmstrips in learning to operate the various machines in the shop. During a general review, filmstrips concerning these machines could be presented for discussion by the group and comparison with their own models of machines. In this case, the instructor can be certain that the members of the group can all see the particular part of the operation under discussion and can also ascertain whether or not it was completely understood. It is possible in such work for individual students to turn out creditable practice jobs without completely understanding why certain operations were included. The filmstrip can help to clarify these misunderstandings. An uncaptioned filmstrip is particularly useful for review purposes, whether or not it has been seen previously. However, the strip must be really visual and show pictorially what it is supposed to show; otherwise the class will not be able to use the pictures to remind them of the knowledge they possess.

Particularly when using filmstrips for illustrative purposes, the teacher can view the strip as a conveniently accessible still-picture file, with the pictures already arranged under subject matter headings. She would use them in the same way that she would use any still pictures for the same purpose. Of course, the principle or point being illustrated should be recalled for the class and the relationship of the pictures to be seen to that principle or point made clear.

The motivation and development of an active, meaningful discussion is often a difficult problem in many classes. The students seem reluctant to talk, either because they can think of nothing to say or because they have a shyness about speaking before their classmates. Surprisingly, such shyness is often evidenced by individuals who in situations other than the classroom have no reticence in talking. These students seldom participate even in daily recitations, but often will take a greater part in a discussion carried on in a room darkened for filmstrip showings. If no other value were gained from the discussion strip, this in itself would be an adequate reward, since once these members of the group realize that they have something to say and can express themselves freely they will gradually learn to take part in other verbal class activity. However, filmstrips contribute much more to a discussion. In the first place, the pictures stimulate the imagination of the students and motivate an interest in the subject matter itself. Secondly, the pictures assist the individuals in finding something to say. Of course, the first comments may not be exactly what the instructor desires and may tend to lead the discussion off on a tangent; however, even such comments are at least a beginning. A skillful leader can guide the discussion and keep it within bounds, but cannot do so until the group shows a willingness to "discuss." Also, the filmstrip itself can assist the leader in holding the discussion to the point, acting as a focus of attention and interest. Since the pictures in the strip are all related to one particular topic, the

students are brought back to the topic whenever a new frame appears on the screen.

The ideal filmstrip for discussion purposes, naturally, is one that presents impartially both sides of a given question. The discussion can then treat with both points of view and the group be led to make decisions of their own. Unfortunately, there are very few strips that present such impartial treatment. However, strips that present only one side or stress one attitude can also be helpful. These, of course, should be carefully introduced, pointing out that only one view is given and indicating that there are other opinions on the same subject. If it is desired that the class reach their own conclusions, this introduction should be as impartial as possible. Otherwise the class members will quickly decide that the instructor wishes them to hold either the opinion given in the strip or the one not there shown, and will obligingly evidence that as their own opinion. Unfortunately, some students will parrot opinions. Some do this out of sheer laziness to do their own thinking; others because they think this will help in getting better grades in the easiest possible way; and still others simply to curry favor with the instructor or to impress him with their ability to arrive at the conclusion he also holds. Another type of response which may occur, if students sense that the instructor favors a particular side of a question, is an immediate decision in favor of the contrary side. Such reaction is frequently caused by individual student's fear that others in the class will suspect him of trying to curry favor with the instructor. If the introduction is properly done, the class will be unable either to parrot or to contradict, and therefore will need to formulate their own opinions. The filmstrip can help them to do so by stimulating independent thinking.

As with any discussion, the success of a filmstrip discussion depends upon the ability of the leader. However, even that leader who is able to draw forth lively and intelligent discussion from even the reticent members of his group and to keep the discussion moving forward can be assisted in his task by the filmstrip. Strips are particularly adaptable for any socialized activity since they have group appeal. Such appeal narrows down the wandering thoughts, concentrating them upon the subject at hand. Questions by the leader designed to open discussion on a particular phase are given more meaning by the projected picture and often the picture helps to clarify the object of the question. The student can make no contribution to the discussion if he is vague about the precise point to be discussed, and pictorial clarification often elicits more response.

There are two major methods of using filmstrips for discussion: (1) by showing the filmstrip first and then holding the discussion, and (2) by carrying on the discussion while the strip is being shown. The second method can perhaps gain most from the strip itself and has been in mind in the paragraphs above. The



first method also has its own advantages and is particularly suitable for older groups and for sound filmstrips. A combination of the two methods is also possible, which is especially useful with more complicated problems. Such a combination involves showing the entire strip rapidly first, without comment, and then showing it again as slowly or rapidly as necessary while discussion takes place. If a sound filmstrip is being used by this combination method, it is a good idea to show it without sound for the second showing; otherwise discussion will be hampered.

With either method, the good discussion leader employs the techniques used with any other type of discussion. However, a few additional points, unique to the filmstrip, should be utilized to gain utmost values from the strip itself. If the discussion is to take place during the showing of the strip, the leader should have complete familiarity with the strip so that the order in which frames or sequences are shown can be changed from the original order whenever necessary to follow discussion. This is not a contradiction of the statement that the filmstrip assists the leader in holding a discussion in bounds. Sometimes the group proceeds without prompting or guiding to a pertinent point, which however is presented in the filmstrip in a later sequence. If the intervening filmstrip information is not necessary to the development of the point brought up by the group, it is well to take advantage of the group's interest and spontaneity, turning rapidly to the proper sequence in the strip. It may be thought unnecessary to show the pertinent pictorial matter since the group arrived at the point by themselves, and therefore do not need stimulation from the picture. However, the picture or the sequence may bring to light further aspects and assist the group in developing the point completely. At other times during discussion, the group may return to a point already discussed. In such cases the strip can easily be turned back to the pictures shown during the original discussion of that point. Seeing the same pictorial material assists the group in recalling their previous ideas and in relating their new thoughts to them.

If the discussion is to follow the screening, without using the entire strip again, it is often a good idea to leave the projector set up in case the need for seeing particular parts of the strip arises. The leader can use such reshowings to bring the discussion back to the topic under consideration, to remind the group of points that were overlooked during the screening, or to clarify items not completely understood. With some groups, a rapid rescreening of the entire strip is desirable. Rescreening can be useful if the group seems to have completed its thinking on the subject without having covered it adequately. Seeing the strip again may stimulate further thought, since it is seldom that a group gets everything a strip has to offer from the first showing. Showing the strip again, after discussion has

been completed, can also be used for another purpose. A thorough thrashing out of the subject in a lively discussion usually alters the group's attitude toward the material in the filmstrip. If it is shown again, the changes in opinion can be brought out. Often when a student realizes that his opinion on a topic has changed and understands how it has changed, he may have a greater feeling of satisfaction over the activity. Also, he is less likely to revert to earlier erroneous opinion, when he understands the difference in his own attitude and feels satisfaction with it. In addition, giving the student the pictorial material to tie in with his newly acquired knowledge assists him in retaining it.

The point has been made earlier that it is often difficult for students to verbalize information gained from pictures. This problem is another reason for being sure that a definite connection is made between filmstrip and discussion. Individuals may recall the visual image more quickly than they recall the discussion itself, and unless the two are closely and clearly associated in their minds, they will not be able to put their remembered knowledge into words. The problem is also another reason for permitting free and full discussion of every filmstrip used, especially during the showing itself if possible. The verbalizing at the time that the picture is presented builds up the desired association and enables the student later to voice what he has learned.

There are a number of supplementary uses for filmstrips, but perhaps the two with greatest possibilities are "picture reading" and auditorium showings, as was mentioned in the first chapter. For picture reading the filmstrip is regarded as another reference tool, and may be assigned in the same manner that any reference book or current publication is assigned, either for the entire class or for individual reports. An instructor may wonder why a strip suitable for supplementary reference for an entire class should not instead be projected during class time. Filmstrips shown during class time should, ideally, deal only with topics important to the subject matter being studied, providing amplification, clarification, and explanation of a particular point that the instructor wishes to stress. Also, such strips generally accompany or illustrate the instructor's lecture or a full discussion by the class itself, and are an integral part of the instructional process. However, sometimes the instructor feels that pictorial material can assist the student in assimilating knowledge to be found in reference assignments and provides a filmstrip to be viewed in conjunction with the reading—the filmstrip providing illustrations which help in understanding the printed page and the printed page helping to interpret the pictures.

A strip can be assigned without any tie-up with a reading assignment when its pictorial content can serve to broaden the group's knowledge and understanding of the unit being studied, showing related aspects that emphasize the importance



of phases discussed in class time. For example, a geography class is engaged in a unit on the southwestern states. During class time the aridity of the region has been discussed and its effect upon the life of the people and their types of work indicated. The instructor wishes the class to see further evidence of this and to appreciate more fully the meaning of such dry climate. Therefore, he assigns filmstrips showing the deserts and their plant and animal life, or of the land prior to and after irrigation projects, or merely of scenic views of the region, or of the life of the Indians of the area and their adjustment to the arid climate. Viewing such strips, the members of the class gain a truer appreciation of the problem and of its pervading effect on all aspects of life in the region. They will be able to understand more easily such points as the scarcity of population and the types of industry or products as they are discussed in class. Furthermore, the pictures will help the class to retain their knowledge about the area, since the climatic reason behind much of the factual data has been indelibly impressed upon their minds. To do this, a large number of pictures may be necessary and the instructor may not wish to take time to project more than one such strip during class.

It is also often desirable to provide filmstrips for such viewing by rapid learners and the intellectually curious students in the group who complete the general class assignments more quickly than others. Such students often waste their spare time, gained by their ability to assimilate knowledge rapidly, unless they are directed to additional meaningful pursuits. However, unless such assignments hold interest for these individuals, the extra activities may be resented and refused as a penalty for being intelligent. The student may grumble to himself, "Just because I can get work done fast, teacher loads me down with more." Such an attitude may result in intentional dawdling and slackness even in the general assignments, merely to prevent further demands for "extra work." The filmstrip, if properly selected, or if the student is permitted to select his own, can help to overcome this problem and provide an interesting presentation of additional information. The intellectually curious are not so likely to resent extra assignments, but they also may be more appreciative if such work involves the use of varied materials and not simply more references and more reading, particularly if additional work appears voluntary on their part.

Individualized assignments can develop into real contributions to the entire class if the student prepares a report. The filmstrip report as a part of follow-up after a filmstrip screening in class has already been discussed; however, similar reports can be prepared which have no connection with a class-viewed strip. Individual reports may be handled in several ways. The reporting student may wish to present the entire filmstrip to the class as a part of his report. In this case, the previously suggested method of preparing a script keyed to the film is generally

used. However, it may be desired to show only a few selected frames or sequences. Such a report is excellent experience for the student in selecting the most important points and the best possible illustrations. Also, he must summarize the information gleaned from the rest of the strip and must relate additional data gathered from other sources to his film-gained knowledge, providing experience in evaluation and organization. Such an experience assists the student in learning how to apply his knowledge. A third method is for the student to report on the filmstrip without showing any part of it to the class. This, of course, is a good verbalizing experience for the reporting student, but may have disadvantages for the class itself—the report may not be so interesting, the individual making the report may not be able to communicate clearly the knowledge he has gained from the pictures, and the class may receive an entirely different impression from the report than the student himself received from the filmstrip. In the latter case, it can be an interesting experiment to project the filmstrip for the class after the student report, without comment, following it with an open discussion.

The teacher may dismiss the idea of using picture reading in spite of its values in teaching because she may feel that the physical problems involved would be more trouble than such a project was worth. However, for individual viewing it is not necessary to project the strip. It can be seen by holding it in the fingers, between the eyes and a light source—a window or any electric light. If this is done, care in handling will prevent mars such as fingerprints. The strip should be held lightly between thumb and finger, letting the fingers touch only the edges of the film and never the actual frames themselves. Although it is usually not necessary, a simple magnifying glass can be used to enlarge the frames for more ease in reading captions and text. Or, a “viewer,” which has a small light under a magnifying glass, can be built in the school shop, the student viewing the strip by sliding it between light and glass. If this method is used, care should be taken not to let the filmstrip touch the light bulb or to be held too near it for a long period, or the film may blister or buckle. Of course, if desired and if an extra projector is available, one can be set up in a convenient spot—as in the library or wherever reference materials are kept for student use. The setup can be as simple as putting the projector on a table and using a light-colored wall as the screen or as elaborate as providing a small screen and building a three-sided wooden booth to provide some darkening.

An experience with a high school public speaking class will illustrate one adaptation of picture reading combined with both student reports and school production. One requirement for this class was to prepare and deliver a speech before a large group other than the immediate class. Naturally, a number of the students disliked this requirement, mainly because they had considerable shyness



about talking before "the public." Some developed "stage fright" at the thought of addressing a gathering, even one composed of fellow high school students. One such reticent student, a basketball captain who had little shyness in other situations, was particularly worried about this requirement. One day he brought to class a number of photographs he had taken while in Canada during the summer, where he had done a number of odd jobs on farms and in forest camps. The pictures also showed something of hunting and fishing. As he showed the snapshots to the class he related his various experiences, knowledge he had gained firsthand about the parts of Canada he had visited, and he answered the questions of his classmates freely with no sign of inhibition or shyness and with considerable self-assurance. In fact, the boy gave a good extemporaneous talk. Another member of the class suggested that Bill should tell his story in assembly during an auditorium program that the speech class was to present later in the semester. Bill immediately and indignantly refused to do so.

However, Bill did make the speech and actually enjoyed the process. A number of other class members shared his hobby of photography. They, together with Bill, used a homemade copier and a simple "candid" camera to prepare a filmstrip of Bill's Canadian photographs. Bill himself organized the pictures in proper order so that he could give a chronological account of his summer's activities. While engaged in this preproduction planning, he found that his own photographs did not include views of two areas he had visited. Since he wished to include in his talk something about his experiences in these places, he found other pictures in books and magazines that would serve the purpose. The finished strip contained no titles, captions, or text. The producing group had considered using a few captions but decided to dispense with the extra work such captions would have entailed since Bill would provide a running explanation.

Bill still refused to stand up in the front of the auditorium by the screen even though the auditorium would be darkened. Therefore, the public address system was used and Bill could hide in a corner with the microphone while another student ran the projector. The showing went very smoothly and Bill delivered a well-prepared, well-organized talk from his "script" notes. After the screening, a number of the students in the auditorium had questions. Surprisingly, even though the lights were now on again and Bill was in full view, he answered the questions and soon found himself standing by the screen at the front of the auditorium talking without hesitance. The picture "crutch," together with the permission to use the public address system, apparently took him over the first hurdle of meeting his audience, and his complete knowledge of the subject matter carried him through.

The rest of the class immediately wished to use filmstrips for their required talks also. One or two had photographs, picture collections, and similar photographable material. They too wanted to produce their own filmstrips for this purpose. Others, however, did not. Their problem was, "What can I talk about to which group and still use a filmstrip?" The school had a small library of filmstrips that were used for various courses and the speech class thought these might provide a possibility. A number of talks developed from that library. One girl selected a nature study strip concerned with water fowl. Working with this pictorial material, she consulted the biology instructor, read a number of reference books, scanned various periodicals, and even talked with a number of the townsmen who were well known for their success in hunting wild duck. From all this research, she prepared a talk on water fowl in general and the water fowl of the locality in particular, which she later gave to a seventh-grade nature study class. Similar talks based on instructional filmstrips were given in elementary geography, general science, and language classes, and to high school history, physics, and Latin classes.

Two more auditorium speeches were given—one on street safety and one on Shakespeare for the school's annual library-week program. Others prepared talks on Italian art for the local woman's club, on modern Palestine for a young people's church group, on history of photography for the school photography club, on industrial applications of electrical principles for the science club, and on Indian pottery-making processes for the hobby club.

The entire speech class project had a number of valuable aspects in addition to providing the students themselves with something to talk about and an incentive for research. They began to comprehend the usefulness of an ability to talk. They saw relationships between their various classes and understood how what they learned in one could be of use in another. The people of the community felt closer to the school and developed more interest in what was being done there. And, necessarily, the cooperating members of the faculty learned that intraclass projects were a worth-while possibility. One incident rather amusingly high lighted this. The student preparing a talk for the history class happened to be a member of that class. Therefore, he promptly inquired of his history instructor whether his speech class talk couldn't be counted as part of his history work. When this request was granted, both speech and history instructors found that the student spent much time and care on his talk, remarking to fellow speechmakers that "mine's got to be good enough for two teachers." Perhaps, the instructors decided, that if two separate reports or projects had been required of that student, he would not have done a good job of either. Other intraclass assignments resulted from this first



attempt, amplifying the feeling that it was after all one school and the classes were often related to each other. One example of this was a report by a girl to both her American history and her American government classes.

Of course, this particular experience took place in a small school where arrangements for talks in other classes and in the elementary grades were comparatively simple to make. However, it is included here mainly to point out the interest aroused by individual use of filmstrips and the stimulation of research, in addition to the obvious value in helping students to overcome shyness in talking in public. It cannot be claimed that all the talks were polished and perfect in every respect, for the speech faults and errors were present as usual. However, there was apparent much more self-confidence and, most of all, a willingness to get up and talk, which had previously posed quite a hurdle for this particular group.

This public speaking class project also provides an example of auditorium uses of filmstrip—a strip as the basis of a student-prepared and delivered talk. Strips can also be used by others as part of an auditorium lecture. The faculty may wish to use such pictorial material in presenting general information of interest to the entire school. A filmstrip can also be used for auditorium showings without detailed accompanying comments as part of a program dealing with some specific topic. Sound filmstrips are often particularly well adapted for such use.

Use of the school-produced strip as a teaching device is also illustrated by the speech class story. The filmstrip to be made provided learning activities by requiring location and organization of material compiled from many sources. Making a filmstrip, particularly by the simple “copier” method, has a number of learning values. Naturally, the project stimulates and motivates research, not only a search for usable pictorial material but also of subject matter. The production provides experience in organization of subject matter, selection of topics to be stressed, and selection and organization of pictorial matter. In productions based on stories, the students must have a thorough knowledge of the tale to be so treated and they learn interpretation through either drawing or selection of available pictures or in dramatization. School productions dealing with school activities help to engender a pride in and understanding of the school and its aims, besides bringing a closer relationship between the school and the groups who see the filmstrip when it is completed.

Most of the utilization methods discussed are adaptable to any age level or any subject matter area. However, filmstrips have additional values and uses at the primary or lower elementary levels. Teachers at these grade levels have used many types of pictorial material successfully for various instructional purposes. The filmstrip provides another pictorial medium, which has some advantages over flat

pictures, for filmstrips are already organized, and the pictures are ready for use in such a manner that the entire group of children can see them at the same time. The storage space problem is negligible, and it is a simpler matter to keep the filmstrip in good condition than to maintain a collection of flat pictures in usable form.

It is with these children that the value of a filmstrip as a substitute for firsthand experience is most evident. There are many objects and situations which young children have had no contact with, and which cannot easily be presented to them in reality—for example, farm life is difficult to show in actuality to children in city schools, but can easily be shown in a filmstrip. Reading readiness programs especially may utilize filmstrips to broaden the child's experience and to develop a meaningful environmental vocabulary. Strips on a number of suitable subjects have been produced for primary and kindergarten use. The teacher can select topics which will enhance her usual program and correlate the strip with whatever subject matter is included in the preprimers she expects to use.

The filmstrip can assist these children in the development of speaking and reading vocabularies not only in reading readiness activities, but throughout their lower elementary learning experiences. If an uncaptioned strip is used, comments on each picture by both teacher and children provide practice in use of a speaking vocabulary and an opportunity to add new words. The child associates the words and the pictures, gaining a meaningful and usable understanding of new words and clarifying his understanding of familiar words. Reading vocabulary enrichment is even more evident. By using filmstrips with captions, the child makes an even closer association of printed word and the object shown. The captions help him to interpret the pictures; and, the pictures help him to understand and remember the words read.

A number of uncaptioned filmstrips, designed specifically for the primary grades, are available. Perhaps the best method in most cases for presenting these is for the teacher to tell the story of the filmstrip as it is first shown, especially if the subject matter is unfamiliar to the children. During the second showing the children should be encouraged to comment about each picture and to retell the story if the strip is one that deals with some fairy tale or other story. If the strip concerns a topic such as transportation or the fire department, the children will probably relate experiences they know about and will ask questions. With a familiar story or topic, the second showing is not always necessary since the children can discuss the pictures without a previously teacher-told story. A filmstrip with captions can be presented in the same manner, with the teacher reading the captions first. Or, the class can read the material without teacher assistance if their reading ability is



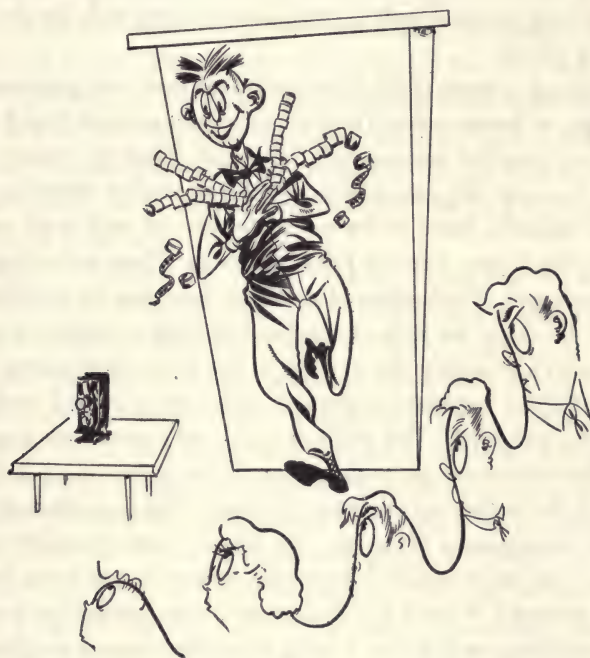
already developed to a point where they can handle the vocabulary of the strip. In this case, it is often found that the children read simple new words with some ease because the pictures help them to comprehend the content of the caption.

Several series of filmstrips are available for these grades which provide suitable material for correlation of several subjects, such as reading, language, and social studies. The subject matter content of one series, for example, is concerned with the activities of children in other countries, constituting teaching material for social studies. The captions are in a simple vocabulary, suitable for reading practice. For use in language these same materials can be the basis for oral stories and with older groups for written stories. Drawing, clay modeling, sand-table activities, and other types of handwork, including the paper filmstrip described earlier, also are natural outgrowths of filmstrip use.

One of the main precautions at this level is to limit the number of pictures shown at one time. Too many pictures may confuse the children and they may make the wrong knowledge-picture or word-picture associations. Most of the more recent filmstrips designed for this age level are intentionally short; however, even with these it is not necessary for the entire strip to be used at one time unless it is desired to do so. A large number of the older productions dealing with fairy tales and nursery rhymes present alternating pictures and text frames (often quite lengthy). These are more difficult to use effectively with the youngest groups. The solid text frames lack interest, the children generally cannot read them and thus the text frame constitutes a break in the continuity of the filmstrip story even when the teacher reads the text for the class. Also, it is more difficult for the children to make a word-picture association since they do not see both at once. If the projector can be adjusted to show both frames (pictorial and text) at the same time, some of these problems can be overcome.

It is possible to use too much illustration in any one class meeting at other age levels also. If only a few pictures are needed to give the students the desired information, it is poor policy to show two or three rolls of film simply because they are available and are related to the subject under consideration. One well-selected strip is enough for any one showing; and, even this strip is sometimes of more value if shown in sections. Pictures to be of value should be studied, not merely seen without comment from either students or instructor. Furthermore, students interpret pictures in terms of their own background unless means for other interpretation is supplied. For example, a picture of a cloud means one thing to a primary pupil, another to a student in a general science class, and still another to a climatology or meteorology student. To point up the conclusions to be drawn and the information to be gained, teacher amplification of the filmstrip is necessary. Projecting a number of

strips in one session is frequently a waste of time; such showing is necessarily somewhat hurried, there is little time for discussion or questioning, and the class retains little except a confused remembrance of a few of the pictures or an incomplete impression of the whole. Often, if the students do remember some of pictures, they are unable to put even this retained knowledge into words.



Enthusiasm for visual aids does not require the use of more than one filmstrip at a time.

*(Filmstrips, Inc. Drawing by Frank Pagan.)*

Throughout this discussion of filmstrip utilization, student participation during the showing has been stressed. In this, filmstrip and motion-picture utilization differs greatly. It has been found that when a motion picture is interrupted, either by a device permitting discussion or other activity while the film continues or when the film is actually stopped to be resumed later, the continuity of thought is broken, turning the motion picture from a single unified film into two, three, or more films—each resumption of screening constituting a new movie. This does not hold true in using a filmstrip. The unity of the strip is retained and in many cases intensified by the accompanying comments or discussion.

Because the filmstrip is admirably suited for such discussional usage, it is often



found to be of greater value than the motion picture for many direct teaching purposes. It becomes an integral part, for example, of the presentation of new information, of a review, and especially of a discussion. On the other hand, the motion picture is often found to be more valuable for such purposes as the introduction and motivation of large units of study, for the presentation of general information, and particularly for auditorium uses. Perhaps the ideal visual material for many purposes is the motion-picture-filmstrip combination, using each for the purpose to which it is best suited.

It will be noticed in many of the filmstrip listings that some producers distribute manuals, guides, or lecture notes. These are varied types and of varied value. Some are free and are supplied automatically with each filmstrip ordered. Others are available at a nominal cost, especially in the case of student materials, which may be desired in quantity. Some of the teacher leaflets are very brief, such as those accompanying the Young America Films' filmstrips. These particular guides contain information, such as indications of grade level and class for which the strip was designed and the aim of the strip; summary of the strip's contents; suggestions for activities prior to and during the showing of the film, emphasizing the teaching points; suggested test questions; a glossary; and a list of related reading material for both teacher and pupils. This guide is usually only about two pages in length, condensing the information and saving time for the teacher using it. On the other hand, many of the teacher materials are very long. This is particularly true of lecture notes for uncaptioned filmstrips. The lecture notes generally identify each frame and provide fairly detailed information, written so that it can be read as the strip is being projected. While it is difficult to use an uncaptioned strip without some method of identifying each frame, reading a complete lecture as given can be an unsatisfactory method if the lecture is too long. The teacher generally prefers to prepare her own comments, adapting the instruction to the needs and abilities of the class. However, the lengthy lecture-note type of guide can assist the teacher in organizing or compiling information to be presented during the filmstrip showing. While reading a long guide takes considerable time, it may save time by giving the busy teacher related information all in one place. Naturally, in most cases, the instructor does not require additional information either from his own compiling or from a guide, since he is well acquainted with the subject matter and can prepare his comments without further search for data.

The lecture notes provided by the American Council on Education, for their uncaptioned strips, provide considerable information and interpretation not found in the strip itself, drawing from the pictorial content of the film conclusions which could not be visualized. Film Publishers, Inc., provides lecture notes followed by

suggestions for conducting a discussion, which include a few good opening questions and point out types of discussion which can be developed from the strip. Some of the strips distributed by the Society for Visual Education are uncaptioned and lecture-note-type manuals are provided for these, identifying the frames and presenting information on each. Lecture notes have also been made to accompany strips that contain both captions and text frames. The frames of the Informative Classroom Picture Publishers' filmstrips are briefly captioned; the accompanying manuals provide stories or factual information for each frame. The lecture notes prepared by the U.S. Department of Agriculture give pertinent information, expanding that given in the strip itself. In this latter case, such long guides serve a definite purpose—the strips are frequently used by community farm groups who have neither the time nor the facilities for locating and compiling all the facts required for a complete presentation of the subject.

Another type of literature which accompanies filmstrips is the booklet which reproduces the frames of the strip itself. Such materials are designed either for the teacher or for the students themselves. The Better Vision Institute, for example, uses the reproduction method, presenting the entire filmstrip and the lecture from the recording that accompanies the strip on a large sheet of paper. This saves time for the teacher, since she can scan the reproduced material and does not need to listen to the lecture on the record when planning the use of the filmstrip. Later, if desired, the sheet can be placed on the bulletin board for reference by the students after the showing. The Fruehauf Trailer Company has prepared booklets that also reproduce both filmstrip pictures and recorded lecture. These can be used by both the instructor, for a preshowing review of the strip, and by the students, for ready reference and review. The Carboloy Company manuals contain, in addition to reproductions of the filmstrip material, reference data such as glossaries, tables, and similar matter. Of all the available printed matter designed specifically for use with a filmstrip, this type is undoubtedly of the greatest value. Unfortunately, this type of literature is also the most expensive to produce, and therefore is not issued for many strips and at present is available mainly for some sponsored materials previously designed for on-the-job training. An example of this elaborate type of guide, designed specifically for school use, is that produced by the Popular Science Publishing Company for their filmstrips. These guides provide an emphasis of teaching points and questions for directing pupil response next to each reproduced filmstrip frame, besides indicating outcomes to be sought and suggesting developmental activities.

A number of producers have used other literature expressly for student use. The National Fertilizer Association provides booklets on subjects related to the



filmstrips that may be used as references or additional reading. The Metropolitan Life Insurance Company has published small pamphlets which give in story form the information presented in their "Health Heroes" series of filmstrips. Definite lesson manuals for students have been published by the Linde Air Products Company, to accompany their series of welding strips, and by the Westinghouse Electric Corporation for the "Electronics At Work" series. The Dartnell Corporation also has lesson books for study together with their salesmanship filmstrips. These companies have designed the lesson manuals and the filmstrip series as units, correlating the two closely. If courses of this nature are being given outside a school situation, the accompanying lesson books are necessary. In a school situation they can be used if desired, but the filmstrips can be used separately and can be integrated into the course of study already being followed.

While a teacher's guide or manual can be of some assistance, materials to be placed in the hands of the students may be more valuable. The competent teacher does not lean heavily upon the manuals, preferring to relate the strip to her own teaching situation. On the other hand, the student can gain much from accompanying written, mimeographed, or printed matter. Printed expendable materials for the use of students can theoretically be made available in the same way as workbooks. The cost of such special materials will delay their widespread use. However, it is not necessary to wait for filmstrip producers to make printed matter for students. The simplest method of accomplishing the same objective is for the teacher to write out appropriate information on the blackboard and have students copy it in their notebooks. This system can be varied by using only major headings on the blackboard, with intervening points to be filled in during the screening of the picture in response to verbal suggestions of the teacher. This system is especially appropriate with silent filmstrips containing captions that do not require a running lecture.

Another simple way of putting something into the student's hands is to have a mimeographed form made up locally to meet the special needs of the group studying the film. Such mimeographed sheets can become a part of the student's notebook or can be made up within a course outline or syllabus if one is being used. A simple summary of the filmstrip's contents, if given to the students prior to the showing, can help them in overcoming the problem of verbalizing. Other teacher-designed materials can consist of questions to be answered as the strip is projected or of a listing of the important points with enough space under each for the student to make notes. Sometimes, particularly when considerable visual material has been used in a class during a quarter or a semester, the various films become confused in the minds of the students. Reference pages of the type mentioned can serve to clarify such confusion.

## NONSCHOOL USE

Community services are becoming increasingly interested in using filmstrip programs to achieve their objectives. Church groups, clubs, and cultural organizations of all kinds are more and more interested in including visual materials in their plans. Each program director has a problem of filling a specific number of dates with stimulating and interesting material. Talented speakers are not usually available in sufficient quantities within the budget range of the organization and the rental of motion-picture projector equipment and films may be too expensive for frequent use. Therefore, filmstrips provide an ideal medium for the dissemination of information of interest to local groups.

Utilization techniques for this type of informal group use are very simple. All that is required is that some member of the group be ready to present the strip and supplement it with his own specialized information on the specific topic under consideration. This individual should also be ready to answer questions and lead a discussion if desired. Such filmstrip utilization can really be classed as a lecture technique, previously described for school auditorium purposes. In such situations, sound filmstrips may be very well received because they frequently contain the very elements of general interest designed to make strips most suited to this use.

Clubs and similar organizations will find that there is considerable filmstrip material suitable for their purposes, and more is currently in production or in planning stages to be released soon. While this book does not list such materials in a separate section, individual titles will be found in most of the subject matter listings. The indication of age level included in the descriptive paragraphs will assist program chairmen in selecting strips that are not too juvenile. Women's clubs and other groups interested in comparable activities will find useful strips on art, archeology, geography, or history. Current topics in filmstrip treatments, designed particularly for discussions, appear in the section on economics, sociology, and related subjects. Farm women's clubs will find titles in the agricultural and home economics sections designed specifically to meet their problems. They too will find strips on other topics in the same sections as mentioned above for other women's organizations. Clubs with women memberships may also be interested in seeing some of the strips produced specifically for young children, such as the various story series, and those on health and hygiene. If a program chairman has in mind a particular topic, a rapid survey of strips available on that subject will soon disclose any which may be of assistance.

For organizations with a central interest (such as literature, international relations, community welfare, child care, specific businesses, or trades) the search for usable filmstrip material is simplified. In some subjects quite a few interesting



strips will be found, as is the case in child care or in salesmanship. In other fields, such as music and advertising, the selection is meager. Church groups, particularly those dealing with young people, will find good material on such problems as intolerance.

Public libraries are becoming increasingly conscious of their role in handling pictures as well as the printed word. Their use of microfilm (usually double-frame filmstrips) has given them contact with the technical aspects of the filmstrip medium. Therefore, it is reasonable to expect that increasing numbers of libraries will make filmstrip collections and arrange for demonstration showings. Since program chairmen already make extensive use of library facilities, they will naturally consult with the local librarian in planning use of filmstrips or motion pictures.

Home filmstrip use can be expected to continue to expand with the increasing interest in miniature photography and the availability of new filmstrip and 2-by-2 slide-projector combinations for the amateur cameraman. Not only will this increase take place in the case of filmstrips suited for club purposes but it is anticipated that many of the filmstrips produced for younger children will eventually occupy the same place in family activities that storybooks and the comic strips now enjoy. Specifically, Young America Films is releasing its Primary Reading Series both as filmstrips and as 2-by-2 slides for home distribution. Home filmstrip use can also be expected to expand for sick children, particularly during convalescence, and for instruction in hobbies. For convalescing children, in addition to projectable strips, the nonprojected films described in the first chapter provide an interesting activity—both the 16-mm filmstrips and the stereoptic views. This type of material is usually best used by children who have recovered enough to be able to sit up, since holding the viewers to the eyes while lying down can be tiring. The stereoptic filmstrips particularly offer a wide selection of subject matter, so that strips within the child's own interests can be selected.

The use of filmstrips in hospitals with convalescing patients is now undergoing intensive study in the special wards of New York's Bellevue Hospital devoted to the pilot rehabilitation program, which is the forerunner of the peacetime adaptation of wartime rehabilitation practices. The basic reason for filmstrip suitability for hospitalized personnel is that the mechanics of filmstrip projection are easier on the patient than reading a book or magazine and do not require the complication and expense of motion-picture projection. Since the filmstrip projector can be tilted to almost any angle, it lends itself to ceiling projection much more easily than other projection systems. Furthermore, pictures at a distance are much easier for the patient to "read" than the average book. Since most hospital ceilings are white, no special screen is required and the patient does not have to assume an

uncomfortable position in order to enjoy a filmstrip. In actual practice, a simple portable projector stand can be employed so that the equipment can be wheeled, with a complete library of filmstrips, from one bed to another, thus requiring a minimum amount of time investment on the part of hospital personnel. The topics of greatest interest to patients are those related to the work or activities which the patient expects to do when he leaves the hospital. Particularly in cases where physical disabilities are anticipated, the patient's will to get well is greatly enhanced by examples of the way in which others are overcoming similar handicaps. Although this type of strip is not currently available, it is anticipated that such subjects will be increasingly available in the near future. For other patients (those convalescing from operations or serious illness, children, etc.) filmstrips on most subjects of individual interest are available and can be used to relieve the monotony of doing nothing but lie in bed. Strips on hobbies, on art, on geography, on stories and fairy tales can be selected by hospital personnel to stimulate patient interests.

The expansion of employee-relations programs within industry has also resulted in a greatly increased use of filmstrips, not only on subjects related to the product or services rendered by the individual company concerned, but also on matters of general interest. For example, a large milk company uses regular filmstrip showings for its salesmen after the day's milk deliveries are completed. The subjects shown include pointers on salesmanship, the importance of milk in the human diet, and the significance of proper diet in the development of our economy. Other companies use filmstrips on general economic and political problems in order to round out program scheduling for weekly, biweekly, or monthly meetings. Many of the available filmstrips on salesmanship are suitable for employee-relations use as well as for training purposes. Those presenting general sales principles are applicable to almost any industry, and those dealing with specific products can be useful in indicating how related products or services are being sold. Much of the filmstrip material on safety is also useful with employee groups—strips are available on both industrial safety and on general street, road, and home safety. Pictures dealing with nutrition and general health can also be incorporated into such programs.

Although the use of filmstrips as a public-relations medium has been amply indicated above in the discussion of industry-sponsored filmstrips suited for school use, it should be pointed out that public-relations messages are being increasingly carried to the interested adult audience via the filmstrip. Such messages have gone far beyond simple sales presentation and examples of the products in use. Particularly in the case of farm-machinery manufacturers, the filmstrips embrace topics of interest to almost any farmer even though these topics may not be directly



related to the product of the manufacturer. Such sponsored strips are used in schools, for club purposes, and with employees. In some cases, they are even used for home showings. Public-relations programs, as well as employee-relations programs, utilize the existing filmstrips on safety subjects. Organizations such as the International Association of Chiefs of Police, the National Conservation Bureau, and the National Safety Council, as well as a number of insurance companies, have produced strips suitable for this purpose. Dealers in smaller towns, desiring to conduct public-relations programs in their own communities, can often use filmstrips prepared by the companies whose product they handle. For example, dealers with General Electric or Westinghouse products will find that these corporations have prepared a number of strips admirably suited for public-relations work.

Perhaps the single greatest nonschool use of filmstrips is in connection with on-the-job training in various vocations.<sup>1</sup> Such training strips are used very effectively in acquainting salesmen with new products or campaigns, introducing new machinery or shop practices in a manufacturing establishment, or in describing the functions and operations of a new product. Filmstrip uses in training programs usually follow the pattern for the training within the particular industry concerned. Since this kind of training is usually not cluttered with the ideological concerns of public education, the introduction of filmstrips has not waited for the stimulus of "visual education experts" and has usually proceeded at a much more rapid pace. An indication of the extent of the use of visual aids in industry was included in a speech before The American Management Association, Mid-Winter Personnel Conference, in Chicago on Feb. 24, 1947, by Daniel Rochford, employee-relations department, Standard Oil Company (New Jersey):

Our survey shows that 70% of U.S. managements use training films. The literature and practices in this field are familiar to nearly all managements. "How to do" and "nuts & bolts" film catalogs and films are in every competent training director's work-kit.

In addition to this use of training films, Mr. Rochford found:

Based on replies from fifty of the leading U.S. employers of labor the survey shows that 62% of large U.S. employers made use of incentive or "employee attitude" motion picture films during World War II. Most managements reported them as very much worth while. Since the war, that 62% has dropped to 34%.

In other words, two-thirds of U.S. industrial managements today are not using morale

<sup>1</sup> An example of the ready acceptance of filmstrips, along with other visual aids, for industrial training, is the way in which such aids are taken for granted in analyzing instructional methods and training department organization within industry. One specific reference containing such material is: MORGAN, HOWARD K., "Industrial Training and Testing," McGraw-Hill Book Company, Inc., New York, 1945.

or employee attitude films. Of course, we haven't had any labor trouble in America since the war! No bad feelings between employees and management!

It is grimly interesting to note that among today's non-users are some of the managements whose relations with their employees have been most conspicuously unhappy since the war.

We are talking about entertainment and educational films, "point of view" films, films which are interesting enough to attract the employee to them on his own free time.

Even though two-thirds of industry does not use employee-relations films, a much larger percentage of classroom teachers overlook this medium. Of course the teaching of skills is not nearly so complicated as presenting academic subjects, but even with this factor taken into consideration, American education could profit by the experience of American industry in the effective utilization of the filmstrip medium.



# Projection

Filmstrips lend themselves to projection more simply than any other projected aid. The bugaboo of combining a sufficient degree of darkness with adequate ventilation is more easily solved with filmstrips than with most other projected aids. The very design of filmstrips does not allow latitude for the operator, which sometimes results in the projection of slides out of order, upside down, or reversed. The lack of moving parts in the equipment does not permit the kind of machine neuroses experienced by some teachers during the operation of a 16-mm sound motion-picture projector. Nor is there the feeling of relief that a novice feels when a 10-minute reel has been run off without interruptions or imagined dire consequences.

The compactness and portability of the filmstrip projector makes it comparatively simple to experiment with different setups in any given room to obtain the clearest possible picture with the minimum of window coverage. Although a shadow-box construction around the screen can be used to solve this problem, most teachers prefer to avoid such cumbersome equipment and to solve their own problem by projecting the strips into the darkest area of the room. As in all projection setups, it is desirable to locate the screen in such a way that the eyes of the audience are not distracted by adjacent slits of light or by beams of light falling directly on the screen. However, if sufficient wattage is used in the projector, there is no reason why a window in the rear of the room cannot be left open and undarkened during the filmstrip screenings. Unless forced ventilation is available, it is absolutely essential that either a window or a door can remain open during showings, because bad ventilation combined with darkness provide an excellent opportunity for the occurrence of drowsiness and inattention. Furthermore, the teacher should be able to see all the students during the showings or the temptation of activities not related to the subject matter of the filmstrip may prove too great for the audience. If discussion is proceeding during the showing, the teacher must be able to see her class members clearly in order to conduct the discussion most effectively.

One danger of allowing the classroom to be too well illuminated is emphasized when color strips are used. It is important that every member of the class can see each picture clearly. There is only one way to be sure that the ratio of light coming from the projected screen and stray light from other sources is adequate and that is personally to view the projected picture from every position in the class-

room. On dull days it may be possible to obtain effective color projection with only part of the window space darkened. On the other hand, on bright sunny days, particularly with snow on the ground, it may be necessary to darken all windows and rely solely on a door opening of a few inches for ventilation.

The mechanics of room darkening depend entirely on the construction of the individual room and the location of windows and doors. The first step which should be taken in any room which will be used for projection is to provide an



Bad ventilation may discourage attention. (*Filmstrips, Inc. Drawing by Frank Pagan.*)

opaque covering for any surfaces which are not usually opened. For example, if the door opening into the hall has a ground-glass window, it will probably be worth while either to paint this window the color of the door itself, to attach a bulletin board to the inside of it, or to hang some heavy curtain which will completely eliminate this source of light which has no value for ventilation. If such action is impractical because the light through this ground glass illuminates the hall, it may be worth while to have a permanent metal shield constructed around whatever ceiling fixtures there are in the hall, which would otherwise throw light directly on such a door window. If the hall lights have frosted globes, it is possible to locate such a small shield inside the globe in such a way that direct rays of light are deflected from the door.

If the classroom has four or five windows at one side, it may be desirable to abandon the front two windows for ventilation purposes and arrange for a heavy opaque covering for these windows to eliminate potential light leaks, which would either be distracting in themselves or would reduce the brilliance of the projected



picture. A very efficient and inexpensive window covering can be made from ordinary monk's cloth faced on the window side with any black material. Such curtains may be hung from the ceiling molding, if there is one, or may be suspended from a specially constructed curtain rod, enabling them to be pulled back when not in use. If the curtains are hung from the molding or nailed directly into the window frame, they can be tied back with an ordinary sash when screenings are completed. Some teachers prefer to leave this type of heavy curtain closed at all times, since it provides an ideal surface on which to hang various bulletin-board materials. A more expensive but just as satisfactory device for darkening windows not required for ventilation can be constructed from wallboard section fitted in grooves so arranged that the sections of wallboard can be pushed to the side of the window when not in use. These panels, too, can be used as bulletin boards. A more inexpensive method, which like the above can be made in the school shop, is a cardboard window covering made with a wooden frame the exact dimensions of each window to be thus closed. These frames are light enough to be handled by students as well as teachers and can be stacked either in a storage room or behind a bookcase when not in use.

If there are so many windows in the room that the teacher is willing to forgo one or two of them permanently, they can be painted out. The advantage of painting out one or two windows is that the windows can still be opened in warm weather and no special covering has to be acquired.

The window-covering problem for those windows that are also used for ventilation during a screening is more complicated, if special coverings are to be used. However, most classrooms equipped with ordinary window shades will find that if the above precautions are taken with potential light sources most damaging to the projected picture, ordinary window shades will be adequate on the remaining windows, notwithstanding the light leaks at the edges.

If special added care is necessary, it is a simple matter to provide permanent protection against light leaks around the sides of the window shades by hanging narrow monk's cloth or other inexpensive curtains permanently at the edges of each window. There are a number of other ways of eliminating these side leaks. One of them is the construction of wooden grooves and facings in which the shade is to travel. Another, with the same results and effect as wooden troughs down the sides of the windows, is a narrow heavy cardboard shield that can be thumb-tacked, nailed, or fastened with Scotch tape down the side of the window frame. In modern schools with metal window facings, it is frequently possible to remove the side of the facing and to insert a cardboard, metal, or wooden shield between the removable section of frame and the side of the window.

Such solutions are extremely effective as long as the window remains closed.

However, in the case of opened windows special precautions should be taken in order to avoid window-shade flapping or the elimination of all circulation by such complete window darkening that the open window is not allowed to accomplish its purpose. In many cases this problem does not arise since it is frequently possible to leave a rear window open and undarkened. Where this is unwise, the best method is to construct a simple wooden louver system designed to permit efficient circulation of air without admitting any light. The simplest louver system can be made on the order of glass deflector shields frequently used at the base of the window. The window shade is pulled down as far as the window, which in turn is lowered an inch or two below the top of the deflector. If glass deflectors are already installed, these can be painted opaque or covered. However, it will probably be preferable to substitute a wooden deflector considerably wider than the standard glass deflectors. It may be found desirable to thumbtack the bottom of the window shade to the window in order to avoid rattling.

Of course each situation will require some local improvisation and if this important problem is given sufficient attention the first time any projected aids are used in a given room, the time thus spent will undoubtedly prove to be a worth-while investment.

Since the location of the screen should be determined, among other things, by the arrangements for darkening the room, it is not surprising that the screen surface to be used also varies with the relative darkness possible in any given situation. The screen surface also depends upon the shape of the room and the arrangement of the audience. If the room is long and narrow with the screen located at one narrow end, a beaded screen will generally provide the best projected pictures. Since the beaded process reflects the picture with the greatest intensity for those seated nearest the center of the room, such a screen is usually helpful in narrow rooms or where the audience is to be seated within an angle of 50 degrees to the screen. However, if the room is shaped so that many students must view the projected picture from an angle, a flat white surface is preferable. This applies in rooms that are exceptionally wide or where the audience must be seated at a considerable angle to the screen. The various surfacing processes for screens are relatively unimportant except in the special case of the long narrow room. If economy is desired, a simple roll-type screen will generally prove sufficient for filmstrip projection. In fact, a plain, *flat* white-painted surface is entirely adequate. Of course, any glossy surface, such as that obtained by use of an enamel, results in an eye-straining glare that is highly undesirable. If a rolled screen must be used, in order to clear the area where the screen hangs for other purposes, particularly if that area contains a blackboard, some movable screen surface is essential. Arrangements to achieve this result can be improvised by hanging a wooden, flat, painted



screen from pulleys in the ceiling, by having a flat, painted wallboard screen designed to slide on a track or rest on the chalk rack, or by use of an improvised rolled screen. A very effective rolled screen can be made out of any window shade by coating the shade surface with the rubberized paint used on white-wall automobile tires. An ordinary sheet can be used as the base for the rubber paint, which will not crack when rolled, or a sheet itself may be stretched tightly on a frame to

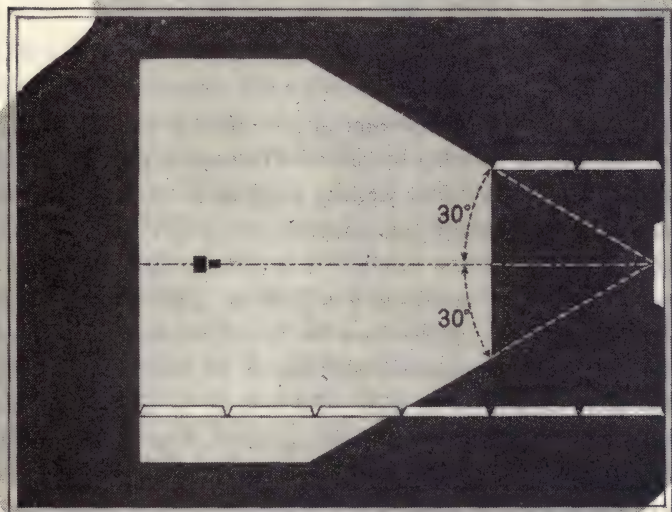


Audience comfort is a factor in securing proper attention. (*Filmstrips, Inc. Drawing by Frank Pagan.*)

provide a very satisfactory projection surface. The only problem with an uncoated sheet is that it must be set closely in front of an opaque surface and each time that it is set up special attention must be given to avoiding wrinkles.

Many schools will prefer to select from the commercially available screens now on the market a manufactured product suited to their requirements. If a new screen is to be bought from a manufacturer, the local visual education dealer can usually arrange for demonstration and installation taking into account all the special variables. The main point in connection with selection of screens for filmstrip projection is that the screen, like the room-darkening arrangements, can be just as inexpensive as local conditions dictate. It is important that every room used for projection have its own screen. It will usually be found more desirable to improvise screen surfaces for every classroom than to attempt to use a portable screen for many different purposes at the same time. If the staff time and detail attendant to the scheduling and movement of a portable screen from room to room is taken

into account, it will become evident that it is better to make the arrangements for an adequate number of screens than to adjust the teaching schedule of individual classes to suit screen availability. It will also be found that tripods and other mechanical suspension devices are often bent and damaged if moved too frequently.



Optimum seating area is between two screen widths and six screen widths from the screen.  
(*Da-Lite Screen Company, Inc. Drawing by York Studios.*)

Rear projection screens are not generally worth the expense in classroom situations although their specialized possibilities sometimes make them desirable. Rear-view projection is very simple in principle, but is usually complicated by the special surface and wide-angle projection lens required. If there seems to be a need for this type of projection, it is desirable to consult an expert before acquiring such equipment.

The further the screen is from the audience, the better. In most classrooms this usually means that the screen is hung on the front wall. The optimum relationship between screen and audience is usually figured by multiplying the width of screen by two to find the distance between the screen and the first row of seats



and multiplying by six to find the distance between the screen and the last row of seats. If the screen is hung too high and too close to the first row, appropriate class attention is unlikely. If it is hung too low, the individuals in the rear rows may have their vision obscured by the heads of those seated in front of them. As a general rule, in small classrooms it is desirable to hang the screen so that the bottom is about on the eye level of the seated class. In this way it is a simple matter to project over the heads of the class without having the picture too high for comfort. Here again it is worth the time invested for the teacher to try out every seat in the class when setup arrangements are being made, so that she can be sure that no student will have any excuse for not seeing the picture.

When room-darkening arrangements and screen location have been established, the audience should be arranged in the best possible seating plan for comfort and clear, unobstructed visibility. One simple step in seating arrangements is to be sure that desirable vacant seats left by absentees be used to improve the vision of students ordinarily in less favorable viewing positions. If the chairs are movable, it is generally desirable to move the audience away from the front corners of the room, concentrating the class as much as possible in the center of the room. The best way to select those seats which will not be used during a screening is for the teacher to try out every seat in the room in order to select those, particularly in the front corners, that are undesirable because of the distortion in the projected picture viewed from too oblique an angle. The students themselves can be counted upon to look out for their own best interests if they are given an opportunity to do so, since anyone who has sat in the front corner of a movie theater will make every effort to avoid repeating the experience. The undesirable seating areas in the front corners will usually be found outside a line extended from the screen center at an angle of 30 degrees to either side of the projector light-beam axis.

Electric-current supply is taken for granted in many situations where this problem is much more difficult to solve than room darkening and provision of screen surface. Fortunately silent filmstrip projectors operate on either alternating or direct current (unless a cooling fan in the projector is activated by a motor or some accessory is employed). Sound filmstrip projectors must always be individually checked to be sure that the type of current available is correct for the equipment or that appropriate converters or adapters are used. The only problem of current selection for silent projectors is that the voltage be suited to the projection lamp. This factor has little or nothing to do with the design of the equipment and can easily be checked by looking at the top of the projection lamp and checking the voltage indicated by a figure, most frequently 110, followed by a "v," and then looking for the same figure on any lamp used on the same circuit. If there is any doubt as to the voltage of a particular circuit, in buildings where more than one

type of electric current is used, it is wise to experiment with a desk lamp or test lamp rather than with the projector since the projection lamps are considerably more expensive than ordinary light bulbs.

The selection of appropriate lamp wattage depends on the circuit in which the projector will be used. In most household and school circuits there is no chance of an overload when not more than 300-watt projection lamps are used. However, whenever greater wattages are employed, it is desirable to have the circuit checked to be sure that an overload will not result. Since the artificial lights are usually extinguished while a projected show is in progress, the chances of an overload are remote when the projection lamp is fed from the same circuit. Many modern schools have base plugs in the rear of each classroom specifically designed for the use of projectors. However, the lack of such a conveniently located base plug should not be a deterrent to the use of filmstrip projectors. The simplest expedient to arrange for filmstrip projection is to run an extension cord from the teacher's desk-lamp outlet to the back of the room. If no extra electrical outlet is available in the room and all electric current used in overhead lights is controlled by a single switch, it will be necessary either to run an extension cord in from outside the classroom or to make an arrangement so that one of the overhead light sockets will be separated from the switch that turns off the others. It is usually a simple matter to have an electrician change the wiring so that one overhead light in the rear of the room is left "hot" all the time and made independent from the remaining artificial illumination. Then this light can be equipped with a special switch of its own and an outlet that takes the plug of the filmstrip projector. It is usually desirable to have this light arranged so that it can be switched on or off without affecting the current supply for the projector, which is itself equipped with a separate switch. This solution of the problem is less expensive and less desirable than having a special electric outlet installed in the baseboard of each classroom where projected aids are to be used. Serious consideration should be given to the permanent installation of appropriate electric circuits and outlets for the use of projected materials, since the use of extension cords is at best an annoyance as well as providing an invitation to falls due to tripping and short circuits due to frayed insulation. No matter how carefully one stores an extension cord it is impossible to keep it clean since it must be run on the floor, and the handling of it immediately before a screening usually makes the operator's hands so dirty that the soiling of the filmstrip is much more likely than if setting up the projector is a clean and efficient process.

In those schools which have no electric current, inexpensive small wattage generators can be used effectively. Since such lack of electric current usually occurs in rural areas, the teacher can expect to have a number of students who are familiar



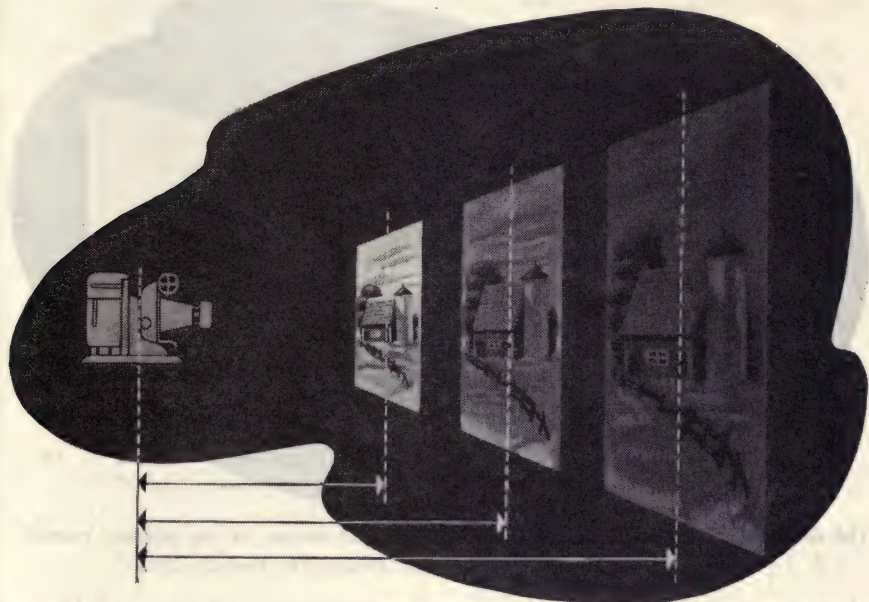
with the operation of gasoline-driven generators. The only important point to remember is that the generator should be located far enough away from the classroom (in an outbuilding if the school itself offers no other location) so that the noise is not distracting. In many cases the teacher will find members of the community willing to loan generator equipment that is not in use during school hours.

In other communities, even though electric power is available, it is "off standard" voltage. In other words it may be so much more than 110 to 120 volts that the use of a projector in the system without a resistor will burn out the projection lamp. This is particularly true in electrical systems of 220 volts, which are still common in some sections of the country. If no resistor is available, to be used in series with the projector, it is always possible to improvise one by wiring an ordinary house lamp or lamps of equal voltage to the projector lamp in series with the projector. These lamps can either be on an extension cord outside the darkened room or can be put in a metal box with ventilation louvers to keep the light from distracting the audience. A simple expedient in a situation where the voltage is in doubt is to look at the voltage reading on a lamp in any ordinary source of illumination, such as a desk lamp, and compare it with the voltage of the projector lamp before turning on the projector. If a lamp rated at 110 volts is used on a 120-volt circuit no serious damage will result except that the lamp will burn out much more quickly than if operated only at its rated voltage.

Screen brilliance throughout the whole picture is the most important factor to look for in filmstrip projection. Many teachers will automatically conclude that the projector with the greatest wattage lamp will provide the brightest picture. This is generally true with older equipment but does not necessarily follow in the case of equipment with improved optical design. The only sure test of screen brightness is a competitive projection of the same filmstrip, preferably in color, under uniform conditions on the various makes and models of projectors being considered. The objective of course is an undistorted picture, clearly visible from every seat in the room where the projector will be used with the anticipated stray light present. Your local visual education dealer will be able to arrange such comparative demonstrations with projectors of several makes set up side by side for simultaneous projection in the location where the projector will be used.

Filmstrip projectors are usually equipped, in wattages of 150 or less, with a single-contact bayonet base very similar to that found in simple one-filament automobile headlights. Projectors of larger wattages generally employ a medium pre-focus base. Some of the older slide projectors with filmstrip attachments have medium screw-base sockets similar to those used in ordinary house lamps, but the screw bases are no longer used in precision projection equipment because the filament cannot be positioned accurately enough in the lens system without a pre-

cision base. The different types of bases employed in filmstrip projectors mean that a larger wattage lamp cannot be used in a projector designed for less than 300 watts unless the socket is changed, and it is usually wise for equipment to be selected with the view to running it only with replacement lamps of the wattage for which the projector was designed. The objective of any projector engineering is the greatest lumen output per watt, but the teacher does not need to be con-



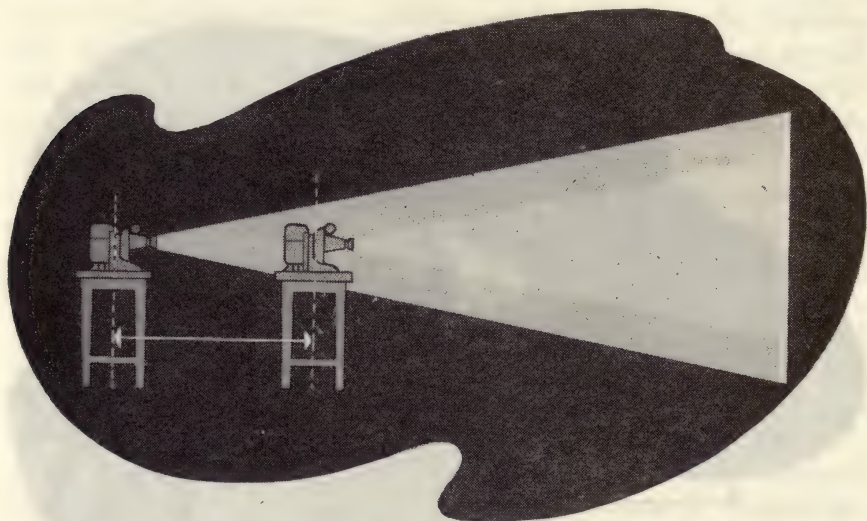
Screen brightness decreases in proportion to the square of the distance from the projection—the smaller the picture, the brighter. (*Da-Lite Screen Company, Inc. Drawing by York Studios.*)

cerned with the relative efficiency of optical systems as long as the desired projector performs satisfactorily in the place where it will be used most frequently. The brighter the screen picture, the simpler the room-darkening problem, and the easier it is for the teacher to guide class discussion while the showing is in progress.

It should be noted that most filmstrip projector manufacturers make available more than one lens size so that the size of the projected image can be established in accordance with the needs of the individual situation. A table showing the projected picture dimensions at stated distances from the projector for the lens sizes commonly available is reproduced below. It will be apparent from this table that one lens is generally sufficient for a filmstrip projector to be used in a classroom or before those groups of a size for which the picture from any given projector will be



bright enough. Even though some lenses will provide for a smaller picture and thus a greater distance from the projection screen, such a small picture may be highly undesirable since by moving the projector away from the screen picture brightness is sacrificed (the brightness diminishes in proportion to the square of the distance from the screen). Furthermore, it is usually unwise to change the projection lens unless the condenser lens is also changed, and consequently the



The size of the projected picture varies directly with the distance of the projector from the screen. (*Da-Lite Screen Company, Inc. Drawing by York Studios.*)

filmstrip user will probably use the screen chart only once—that is, when selecting a projector. After that, in each projector setup the projector will be located at a distance from the screen which gives the desired picture size. Since there is little or no noise from filmstrip projection, it makes little difference if the projector is set up in the middle of the class or group and it is not necessary to go to special lengths to have projection from the back of room. In many situations it will be found that the acquisition of a few extra filmstrip prints will be more valuable to the filmstrip user than an extra lens.

The size of the screen image is governed by the focal length of the lens and the distance from the projector to the screen. The following table indicates the size of horizontal pictures obtained on the screen with lenses of different focal lengths at stated distances from the screen. If vertical pictures are projected, the proportions are reversed.

SCREEN TABLE FOR FILMSTRIP PROJECTORS<sup>1</sup>

Distance from machine to screen, feet	Size of picture	Single frame				Double frame				
		Focal length of lens, inches				Focal length of lens, inches				
		3	4	5	6	3	4	5	6	7
10	Height	2.3	1.7	1.3	1.1	3.0	2.3	1.8	1.5	1.3
	Width	3.0	2.3	1.8	1.5	4.6	3.4	2.6	2.2	1.9
15	Height	3.4	2.5	2.0	1.7	4.5	3.4	2.7	2.3	1.9
	Width	4.5	3.4	2.7	2.3	6.8	5.0	4.0	3.4	2.9
20	Height	4.5	3.4	2.7	2.3	6.0	4.5	3.6	3.0	2.6
	Width	6.0	4.5	3.6	3.0	9.0	6.8	5.4	4.6	3.9
25	Height	5.7	4.4	3.5	2.9	7.6	5.8	4.6	3.8	3.3
	Width	7.6	5.8	4.6	3.8	11.4	8.8	7.0	5.8	4.9
30	Height	6.8	5.1	4.0	3.4	9.1	6.8	5.4	4.5	3.9
	Width	9.1	6.8	5.4	4.5	13.6	10.2	8.0	6.8	5.9
35	Height	7.9	5.9	4.8	4.0	10.5	7.9	6.4	5.3	4.5
	Width	10.5	7.9	6.4	5.3	15.8	11.8	9.6	8.0	6.8
40	Height	9.1	6.8	5.5	4.6	12.1	9.1	7.3	6.1	5.2
	Width	12.1	9.1	7.3	6.1	18.2	13.6	11.0	9.2	7.8
45	Height	10.2	7.6	6.2	5.1	13.6	10.2	8.2	6.8	5.8
	Width	13.6	10.2	8.2	6.8	20.4	15.2	12.4	10.2	8.7
50	Height	11.2	8.4	6.8	5.6	14.9	11.2	9.0	7.5	6.4
	Width	14.9	11.2	9.0	7.5	22.4	16.8	13.6	11.5	9.6

<sup>1</sup> Screen manufacturers will supply detailed information on precise screen sizes. For example, the Da-Lite Screen Company, Inc. (2711 North Crawford Ave., Chicago 39, Illinois) has published the following formula which they will apply to any given situation on request:

“For any movie or slide, at any projection distance, with any lens, multiply the size of the picture aperture by the projection distance and divide by the focal length of the lens. Size of aperture and focal length of lens must be in the unit, such as inches. Then if projection distance is in feet, inches, or meters, the screen size will be in the same unit of measurement.

Five-inch lens is standard with most 35-mm single- and double-frame filmslide projectors.

Standard Apertures:

- 35-mm Single-frame slides ..... 0.9" wide ..... 0.68" high
- 35-mm Double-frame slides ..... 1.3" wide ..... 0.9" high



Pictures of some filmstrip projectors are reproduced here to show the general appearance of the equipment. All filmstrip projectors have the basic elements in common. These include the following: a lamp house consisting of a metal box with appropriate openings for ventilation, with louvers to prevent the light from escaping; a lamp socket, either medium prefocus or bayonet base, designed to take standard projection lamps in such a manner that the filament is centered behind the optical system without any special adjustment; the lamp base, usually wired to a switch with asbestos-covered wire as a precaution against overheating; 8 to 10



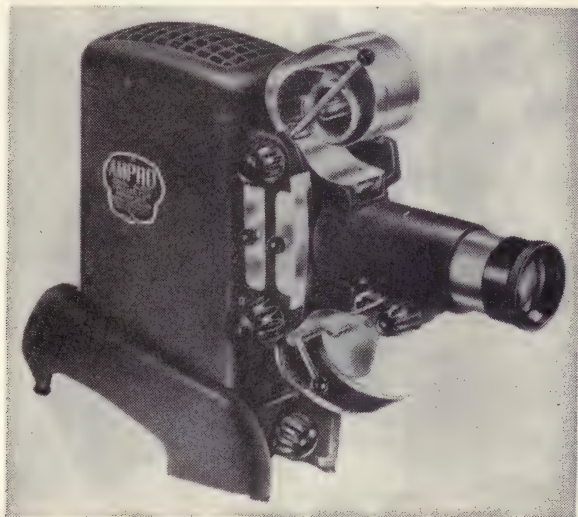
The standard model Illustravox, sound-filmstrip projector. (*The Magnavox Co.*)

feet of ordinary lamp cord, usually provided to give a sufficient range of operation for most rooms equipped with adequate electric outlets. Immediately in front of the lamp house there is a condensing lens system behind a heat-resisting glass water cell, or fan-cooled surface. The filmstrip passes directly in front of the heat-reducing device from a holder on top, through the aperture over a set of sprockets, and out of the bottom of the projector. In front of the film gate a projection-lens barrel is mounted. The projection lens usually moves in the barrel for focusing and is generally interchangeable with other lenses of varying focal lengths. In addition to the projector elements, most filmstrip projectors are supplied with a carrying case and many with a 2-by-2 slide adapter. It is always wise to have one or two spare projection lamps handy in case of emergency, and these may be generally stored in the carrying case with the projector.

As noted in the first chapter, sound filmstrip projectors inherently consist of a silent projector plus a playback for the record, either 78 or 33 $\frac{1}{3}$  rpm. If a turntable

is acquired separately from the filmstrip projector there are no other special considerations to look for than when a combined unit is acquired. Any radio dealer will be able to give good advice on the relative merits of playback equipment. Here again a simple empirical test of the output should be sufficient for most teachers.

Setting up a projector for use is a simple operation and should be done before class time if possible. Manufacturer's instruction booklets are supplied with projectors and should be consulted by inexperienced projectionists. However, the procedure usually includes the following steps:



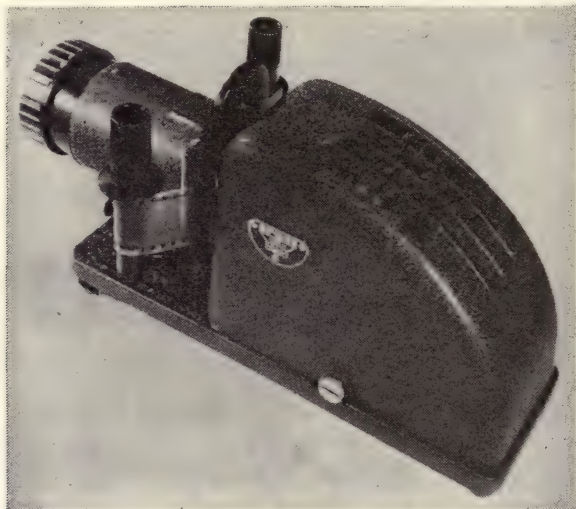
The Model 30 D Dual Slide Projector. (*Ampco Corp.*)

1. Remove the projector from its case and place it on a table or stand. Take the lens from the case and insert it in the lens barrel if it is not already in place.
2. Threading—Unwind a few inches of filmstrip and insert the free end in the film gate. If the sprocket-hole positioning is not automatic, place the sprocket holes of the free end of the film over the sprocket teeth and hold them in position while closing the film gate if the film gate is movable. Turn the knob carefully to test the threading. If any binding is noticed, don't force the knob to turn or the sprocket holes of the film may be enlarged, thus damaging the film. Instead, correct the threading.
3. Focusing—Plug in the connecting cord and turn on the projector switch. The cord can be looped around a leg of the stand to guard against pulling the projector off the stand if anyone happens to jerk the cord. Pull out the lens a little and turn the knob that moves the filmstrip until a frame appears on the screen. The first part of the strip is generally leader, or blank film, to be used while threading and to hold the strip in the film channel. Most filmstrips have a "focusing frame," con-



sisting of a line or circle design often with the word "focus." If the strip being used does not have such a frame, any frame can be used for focusing purposes—the title frame or one of the pictorial frames. Rotate the lens, pulling it out of the barrel or pushing it in a little at a time, until the screen image is sharply clear.

4. Framing—The entire frame image should appear on the screen and the sides should not show light streaks of the sprocket holes. There is usually a framing device to center the strip vertically. Horizontal framing, to eliminate light streaks or

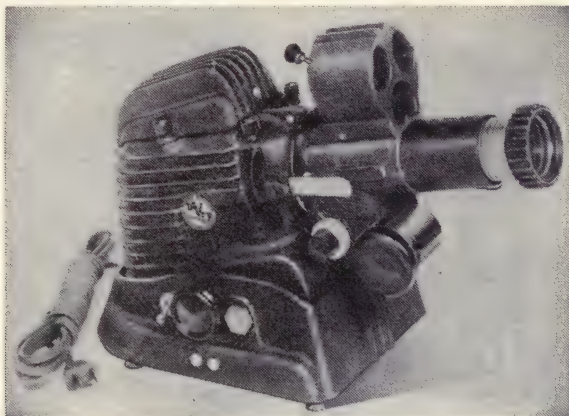


The All-purpose Argus Projector. (*Argus, Inc.*)

sprocket holes showing at the side of the frame, is usually accomplished by adjustable masking elements in or near the film gate, used to convert the projector from double- to single-frame projection. If the image is too low on the screen, the projector can be tilted. Most projectors have tilting devices on the machine base. If the image needs to be higher than the device allows, a higher table should be used. If one is not available, the projector can be placed on a pile of books. In this case, be sure that the books are stacked neatly, so that they will not topple, and that they provide a surface broad enough to hold the projector.

5. Move the filmstrip to the first frame desired for the showing and turn off the projector switch. The filmstrip is now ready and nothing needs to be done at the time of the actual screening except to turn on the switch again. If the connecting cord passes over an area where students are likely to pass, remove the plug, and place the cord on the table with the projector, plugging in again just before the screening.

To set up for double-frame filmstrip projection, the procedure is the same except for two extra steps. Projectors designed to take such strips generally have a small metal mask over the aperture. This is removed by simply sliding it out of its holder when a double-frame strip is to be shown. Since most double-frame filmstrips use horizontal pictures, the projector head should be turned 90 degrees so that the film channel runs at right angles to the lamp house. If the strip contains some vertical frames, the head is turned back when necessary.



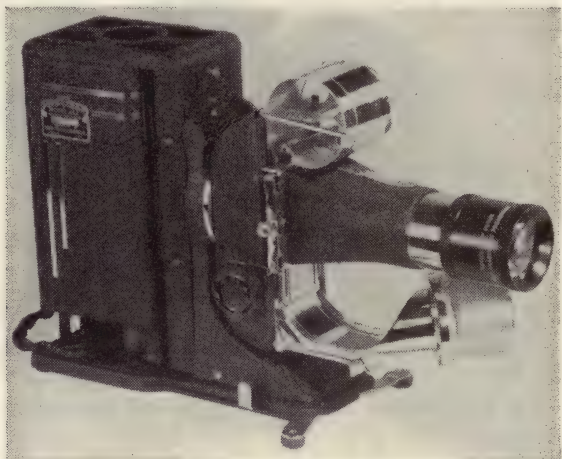
The Triple-purpose Slide Film Projector. (*De Vry Corp.*)

Generally filmstrips are properly rolled when they are received so that they are ready for projection. However, if the end frame appears instead of the title frame, simply remove the strip from the projector and reroll it. This can be done very quickly, but care should be taken while doing it to prevent any marring of the strip. Start by holding the end of the filmstrip by the edges near the sprocket holes and wind the strip into a tight roll with the fingers. Rolling the strip loosely and then pulling on the end to tighten the roll causes scratches on the film. Holding the strip near the edges prevents finger marking of the frames. The leader at the beginning and end of most filmstrips allows for ease in threading or rewinding, without marking the film. If the image on the screen is reversed, the strip has been rolled with the emulsion (dull) side of the film to the inside of the roll instead of to the outside. It is not necessary to worry about which is the emulsion side and which is not; simply reroll the film in the other direction and the emulsion side will be toward the lamp as it should be when the strip is again threaded into the machine. Such rerolling takes a little more time than the simple rewinding described above, even though it is done in the same manner, since the winding



goes against the curve in the film, which naturally tends to curl in the direction in which it was previously wound.

For sound-filmstrip projection, the projector itself is set up in the same way as for silent projection. The record player, however, must also be set up. Place the speaker near the screen. See that the player is set at the proper speed. Some playbacks operate at only one speed and don't need to be checked. In this case, however, check the recording to be used to be sure that it has been cut at the same speed. Plug in the connecting cord and turn on the switch to warm up the tubes. Use a new needle and test the setup by playing part of the record. Notice on the



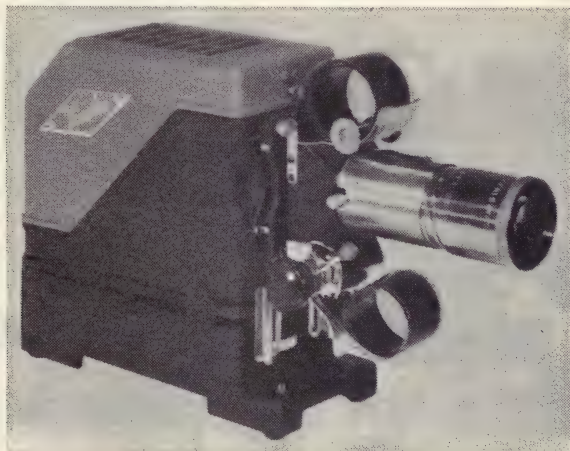
The Model AAA Tri-purpose Projector. (*Society for Visual Education.*)

record label whether it should be started on the inside or the outside. While testing, set the volume control and tone control. The player is now ready and all that needs to be done at screening time is to warm up the tubes and start the motor. Be sure to allow time for warming up the tubes; otherwise the students will not be able to hear the first part of the record. To synchronize recording and projected picture during the actual showing, turn the strip to the next frame whenever the gong, bell, cricket, or other device on the recording is heard.

The projector requires little maintenance other than cleaning. The aperture glasses, lens, and mirrors should be cleaned with lens paper or some other very soft paper. A soft lintless cloth may also be used. Be certain that it is lintless, however, or the fuzzy lint left on the lens will appear in the projected image, clouding the picture more than the dirty lens. Nothing harsh or rough should be used for this cleaning; otherwise the glass may be scratched. Just clean these surfaces as carefully as spectacles or eyeglasses are cleaned. The rest of the machine

should also be kept free of dust and dirt. Storing the projector and lens in the case generally provided with it protects the glass surfaces from breakage, cuts down the amount of dirt, and protects the cord from fraying. Both the projector's connection cord and any extension cords used should be checked periodically to be sure that the insulation is not frayed or worn.

Filmstrips require little care to keep them in good condition. The major point is to prevent marking, scratching, and soiling. If the film is rerolled properly after



The Model AP—2C Combination All-purpose Projector. (*View Lex, Inc.*)

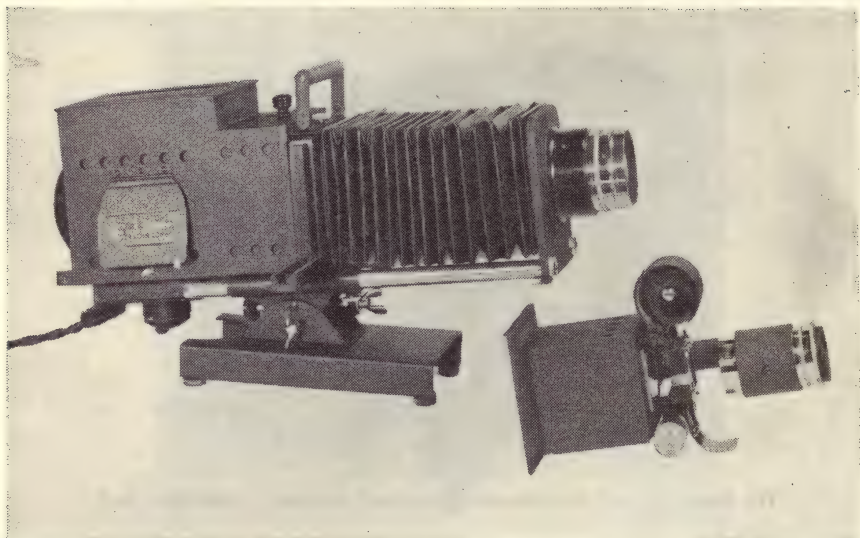
each showing and replaced in its container, the strip will be protected. A rubber band can be placed around the strip before putting it in the can to prevent the roll from expanding and becoming scratched on the sides of its own container. However, the outside of a rolled filmstrip is generally leader film so any such scratches do not mar the strip itself. It is better to rewind a filmstrip in the fingers as described above than by turning it back through the projector. In going back through the projector, the film passes the hot glass again which dries the strip more than necessary. Also, scratching may result. A little care in handling the strip itself will prevent finger marking.

To summarize, preparation for a filmstrip showing includes the following:

1. Check the room arrangements, previously worked out, for
  - a. Darkening.
  - b. Ventilation.
  - c. Screen placement.
  - d. Seating arrangement.
  - e. Electric connections.



2. Set up projector
  - a. Thread.
  - b. Focus.
  - c. Frame.
  - d. Be sure lens and glass surfaces are clean.
  - e. Set on first frame and turn off switch.



The Model D Delineascope, primarily designed for projecting  $3\frac{1}{4}$  by 4 inch glass slides, with filmstrip attachment. (*American Optical Co., Scientific Instrument Div.*)

For sound filmstrips, also

- a. Set up speaker.
  - b. Set up record player.
  - c. Adjust tone and volume controls.
3. At time of filmstrip showing
    - a. Quickly darken room, adjust ventilation, set up screen and rearrange seating if these arrangements could not be completed prior to class time.
    - b. Turn on projector switch and start the showing. (If it has been necessary to unplug the connection cord prior to screening time, replace the plug before turning on the switch.)

If a sound filmstrip is used, also

- a. Warm up the tubes and start the motor.
  - b. Turn on the projector light.
  - c. Start showing the strip and playing the recording.
4. After the screening (usually after the class is dismissed)
- a. Rewind the filmstrip and place in its container.
  - b. Put projector away in its case.



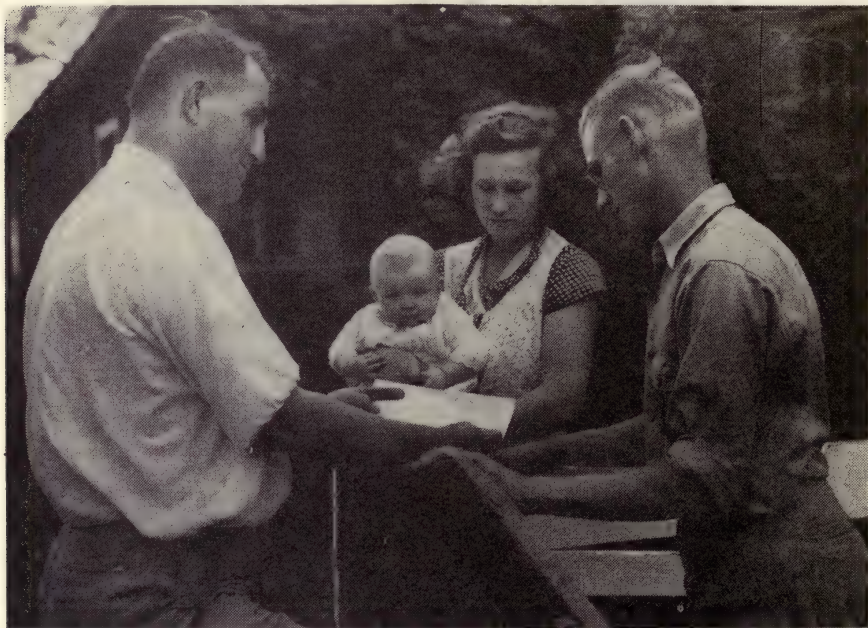
Student projection requires attention to proper focusing. (*Filmstrips, Inc. Drawing by Frank Pagan.*)

While the above outline procedure seems long, its actual performance takes very little time, particularly after some experience has been acquired. Whenever possible, the actual mechanics of room arrangements, setup, and projection should be delegated to a member of the class. This frees the instructor for teaching purposes during the filmstrip showing. He can stand near the screen to point out important parts of the picture as needed, can face the class while making comments, and can lead discussion during the showing more easily than if he is in back of the room by the projector. Furthermore, such a procedure allows for one form of class participation. Even elementary school pupils can handle such responsibility well if properly trained. The use of filmstrips does not require the teacher to become a technician, since the equipment is so simple that any student able to operate a radio at home can be a successful filmstrip projectionist, and equipment selection, maintenance, and technical details described in this chapter are usually delegated to some member of the staff who has mechanical interests or a technical background.



# Agriculture and Forestry

Most of the filmstrips in this classification were produced by the U. S. Department of Agriculture and are designed specifically for vocational agriculture-instruction in high schools, colleges, and with adult groups. In general, these strips tend to contain considerable text material with numerous text frames. In some cases



Tenant farmer and wife discussing with the county agent plans for financial aid toward the purchase of a farm. From filmstrip "The County Agent." (USDA Extension Service. Photo by G. W. Ackerman.)

long shots are used where close-ups would have been more helpful, particularly for the more inexperienced groups. No additional evaluation comments are made on the strips in these groups, except where differences occur as in those suitable only for elementary grades or general surveys, since these strips are similar in scope and treatment to other materials released by the Department of Agriculture.

Some aspects of agricultural work have been treated in filmstrips quite thoroughly; however, other aspects have been touched only lightly or not at all. Farm

machinery, buildings, and equipment could well be more adequately covered. Marketing, although an important phase, has been handled in only a few specific cases such as the marketing of wool.

Very little filmstrip material of value to classes interested in other phases of agriculture than the vocational is now available, particularly on high school or college levels. For these classes, new filmstrip production might indicate such topics as the economic problems involved, the relationship of our agriculture to foreign trade, comparisons of our agricultural methods and production with those of other leading producer countries.

The available material on forestry includes very little that is directly applicable to vocational training in the field. The approach in most films is either related to farm woodland management or is general in nature.

In vocational agriculture, the filmstrip has a number of uses, the major ones including:

1. To demonstrate techniques
  - a. Before field demonstration or practice to allow for emphasis of specific points.
  - b. After field demonstration or practice as review or discussion guide.
  - c. At times when or in places where actual practice or demonstration is not feasible or is not desired.
2. To present diseases or insect pests where these cannot be closely observed in crops or animals, particularly when the complete life cycle cannot be otherwise followed. When actual observation is possible, the filmstrips provide means for introduction or review.
3. To illustrate and to provide comparisons of poultry and stock breeds; types of buildings, machinery, and equipment; and of practices employed in various parts of the country.

In general study of agriculture, without vocational training, the filmstrip provides an easy method of illustrating farm topics and agricultural problems being studied, particularly in city and town schools.

## ANIMAL HUSBANDRY

### BEE CULTURE

**Bee Culture Series** (USDA, 4 films, si, lecture notes).

**Anatomy of the Honeybee** (No. 151, 33 frames). Drawings and photographs showing in detail structures of the parts of worker, queen, and drone.

**Diagnosis of Bee Diseases in the Apiary** (No. 171, 58 frames). Symptoms of different diseases of bees distinguished in apiary and methods of control.



Laboratory experiments of disease cultures and healthy bee broods; American foul brood, European foul brood, para-foul brood, sacbrood, fungus diseases, acarine disease, the bee louse. Designed for extension workers, state apiary inspectors, and instructors in apiculture.



From filmstrip "Feeding and Care of the Dairy Calf." (*Bureau of Dairy Industry, USDA.*)

**First Lessons in Bee Keeping** (No. 346, 41 frames). Standard equipment and practical methods of handling bees for production of honey for home use. Unprofitable and modern hives compared.

• **Transferring Bees to Movable-frame Hives** (No. 616, 36 frames). Step-by-step method, in detail, of transferring bees from box hives and log "gums" to modern movable-frame hives. Indicates increase in honey production if bees are handled by modern methods.

## DAIRYING AND CATTLE PRODUCTION

**Artificial Breeding of Dairy Cattle in Vermont** (USDA, No. 1287, si, 51 frames). How a good artificial-breeding program produces better cows and improved herds; makes the service of good bulls more widely available; eliminates the care, danger,

and cost of the herd sires; produces more salable stock; and increases milk production and profits.

**Cattle and Beef Industry** (Stillfilm, si, 30 frames). A general survey of the industry indicating type of land used for grazing, comparison of United States and Argentine ranches in production, dairy-type cattle, dairy stations, important dairy breeds, beef-type cattle, beef breeds, fattening for market, raising calves, marketing baby beeves, the stockyards. Suitable for upper elementary or junior high school classes.

**Dairy Herd Improvement Association: Identification and Permanent Record Program** (USDA, No. 554, si, 37 frames, lecture notes). Identification markings employed by the association; methods of ear tagging; records of identification and production. Tabulation of records with U. S. Bureau of Dairy Industry.

**Dairying** (Stillfilm, si, 30 frames). Survey of dairying industry, including importance of stock selection, various breeds and their purposes, dairy records, proper barns, pasturage and silage, equipment required for transport of milk. Rank of United States in dairy industry. General information suitable for upper elementary or junior high school classes.

**Farm Dairy Houses** (USDA, No. 140, si, 48 frames, lecture notes). Floor plans and equipment for different types of dairy houses made of wood, brick, tile, or concrete. Location for milkhouses. Necessity for cleaning all equipment. Types of water-supply pumping plants.

**Feeding and Care of the Dairy Calf** (USDA, No. 623, si, 47 frames, lecture notes). Housing, health, feeding, training, earmarking of the dairy calf from birth to full development. Also suitable for upper elementary or junior high school groups interested in dairy calf projects.

**Handling Livestock for Market** (Castle, made by USOE, No. OE-459, si, manual). Designed for use with motion picture of same title, but may be used separately for review purposes or as discussion guide. Information in question form on causes of losses in marketing livestock, on how to prevent injuries to livestock on the farm, on preparing the truck to haul livestock, on handling of stock before shipment, on preventing injuries when loading and during shipment.

**Improvement of Plants and Animals Through Breeding** (Nasco, No. SF 81, si, 102 frames). Part I (23 frames) presents the cell as the basis of livestock improvement and outlines the fundamentals of cell structure, relation of cells to growth, cell division, sexual reproduction, the maturation process, chromosomes, egg, sperm, and fertilization. Part II explains how characteristics are transmitted. Explains the following: genes and their relationship to inherited characteristics; dominant and recessive traits; homozygous and heterozygous individuals; incomplete dominance and its results; inhibiting genes and their effects; sex-linked traits;



crossing over of chromosomes; mutation. Examples of actual crosses given. A number of incomplete inheritance checkerboards included for students to complete. Discusses selection and its importance to breeding. Ends with a glossary. Very long with considerable text, but presents inheritance of traits simply and clearly. Designed specifically for agricultural courses, but may also interest biology classes as supplementary material.

**Making American Cheese on the Farm for Home Consumption** (USDA, No. 352, si, 25 frames, lecture notes). Preparation of milk for making curd, followed by detailed steps in making the cheese. Necessary equipment and supplies indicated. Also suitable for classes in home economics.

**Making Butter on the Farm** (USDA, No. 380, si, 32 frames, lecture notes). Equipment and its care, with emphasis on recommended practices in preparing cream for the churn. Steps in making butter demonstrated. Also suitable for home economics classes.

**Making Cows Pay** (Allied Mills, sd, about 1,250 frames, 25 min, loan). Information concerning importance of culling the herd, keeping records, and developing a good feeding program. Major portion of strip concerned with feeding-program requirements. Advertising of Wayne brand feeds contained in information on feeding program. Good material on feeding-program planning.

**Marketing Feeds through Dairy Cows** (USDA, No. 379, si, 28 frames, lecture notes). Various types of dairy cows; methods of determining their value; kinds and values of feeds presented.

**Milk Quality Improvement in 4-H Dairy Clubs** (USDA, No. 182, si, 39 frames, lecture notes). Designed to aid in creating interest in improvement of milk quality. Demonstrates care of dairy utensils, grooming of cows, proper milking practices, care of milk, tests of milk samples. Includes 4-H Club meetings; achievement rewards; essay contests; health champions. Stresses importance of quality milk for health. Also useful with upper elementary groups interested in 4-H Club work.

**Modern Herd Management** (Ralston-Purina, si, 36 frames, color, loan). Scenes of experimental farm and dairy herd of the Ralston-Purina Company, indicating various practices, such as vaccination, weaning, culling of herd, drying of cow, keeping individual records, feeding program. Some advertising.

**Producing and Handling Clean Milk** (Nasco, No. SF. 51, si, 78 frames). Opens with explanation of clean milk. Producing clean milk: the essentials—clean healthy cows, clean barn and dairymen, sterilized utensils. Other good management practices presented in some detail with indications of how each may be achieved.

Handling clean milk: methods of cooling milk and keeping it cool until delivered; reasons for proper cooling. Examples of good dairy barns, milkhouses, and equipment. Pictorial material consists of photographs. Uses superimposed captions and some text frames. Well-organized and visualized strip on milk production methods, suitable for agricultural courses and adult groups.

**Production of High Quality Cream for Butter Making** (USDA, No. 429, si, 28 frames, lecture notes). Practices recommended, including clean milking, clean farm surroundings, prompt cooling, frequent delivery. Stresses importance of cleanliness.

**Some Methods of Estimating Milk Quality by Bacterial Tests** (USDA, No. 170, si, 51 frames, lecture notes). Requirements for the production of good milk, with emphasis on cleanliness of utensils and surroundings. Steps in three tests of estimating bacteria in milk—plate method, estimating with microscope, methylene blue test.

**Some Principles of Breeding Demonstrated with the Herediscope** (USDA, No. 278, si, 39 frames, lecture notes). Some basic information concerning fundamental laws of heredity. Use of the herediscope. Charts of proved sires, their daughters' production and chart, succession of proved sires. Designed particularly for extension workers. Should be used only in connection with demonstrations of the herediscope.

**Tables, Graphs, and Charts Relating to Dairy Production** (Nasco, No. SF. 53, si, 47 frames). Forty charts, graphs, or tables presenting information on various phases of dairying. Some of the subjects included are comparative costs of producing 100 pounds of milk; relation of milk production to cost and profit; relation of production and proportion of cows milked to returns; quantities of feed and labor required to produce milk; income over cost of feed at various stages of production; comparative production of purebred and grade cows; production of milk and butter fat of different breeds; estimated value of good proved sires; milk required to bring calves up to 150 pounds, nutritive value and digestibility of various feeds; effects of fertilized pastures; normal growth in weight of dairy cattle. Excellent source material for vocational agriculture instructors.

**Winter Feeding of Dairy Cattle** (Nasco, No. SF. 52, si, 96 frames). Nutrient requirements, sources of nutrients, methods of estimating amounts of feed, methods of balancing the ration, supplying minerals and vitamins, water supply, preparation of feed. Stresses importance of proper feeding for high production at lower feed cost per unit. Purposes for which cow uses feeds. Graphs showing increased returns from better feeding. A complete and detailed story of proper feeding of dairy cattle.



## HORSES

**Care of Horse's Feet** (USDA, No. 162, si, 37 frames, lecture notes). Importance of correct care; effects of incorrect or improper care; details of proper care, including correct trimming of hooves, removing uneven growths, rasping, proper shoeing.

**Horseshoeing** (Castle, made by USOE, No. OE-458, si, manual). Designed for use with motion picture of same title, but may be used separately for review purposes or as discussion guide. Presents the following through questions and photographs: handling the horse; correct position for holding feet, preparing feet; selecting, fitting, and nailing the shoes; taking off shoes; tightening old shoes.

**Judging Draft Horses** (USDA, No. 132, si, 58 frames, lecture notes). Breeds of draft horses and how to observe main points in judging them. Typical score card for judging illustrated. Methods of scoring on walk and trot. Includes drawing of a horse with parts labeled, showing defects.

## POULTRY PRODUCTION

**Building Profit Pullets** (Allied Mills, sd, about 30 min, loan). Describes steps in poultry management to start and grow baby chicks into profitable pullets. Includes data on importance of good stock, equipment needed for chicks, floor-space requirements, estimating number of chicks to order on basis of laying-house capacity; the brooder house—sanitary measurements, location, temperature, feeds, ventilation, feeding methods. Feeds for growing chicks and methods of feeding; sanitation measures, use of outdoor feeding lots, housing pullets when first egg is found; culling; preparing laying house for pullets. Major stress on feeding, with some advertising for Wayne feeds since each feeding program recommended indicates types of this brand. In addition to advertising, good general information on poultry management.

**Chicken Lice, Mites, and Other External Parasites** (USDA, si, 49 frames, lecture notes). Mites, their effect on chicken feathers and wings; dusting and dipping control methods. Lice and other parasites, their effect on wings and feet; methods of treatment and control.

**Controlling Parasites of Chickens** (USDA, si, 23 frames, lecture notes). The following parasites and their location in chickens: roundworms, gapeworms, crop worms, gizzard worms, common roundworm, tapeworm. Life cycle of roundworm and tapeworm. Methods by which chickens become infested. Control procedures, with emphasis on sanitary equipment and surroundings.

**Farm Poultry Raising** (USDA, si, 41 frames). General survey of poultry raising, including some standard breeds, factors affecting fertility and hatchability, equipment and housing, feeding and sanitation.

**Feeding for Egg Production** (Nasco, No. SF. 71, si, 71 frames). Charts and graphs indicating nutrient requirements, methods of estimating amount of feed needed per bird, estimating amount needed for egg production, part of total intake used for egg production. Sources of various nutrients indicated. Hen's



From filmstrip "Full Egg Baskets." (*Allied Mills, Inc.*)

needs for each type of food indicated. Methods of providing balanced ration. Several sample rations included. Methods of feeding. Each section followed by summary.

**From Chicks to \$\$\$** (Ralston-Purina, si, 99 frames, loan). Importance of selecting the right chicks, providing proper feed, and having a sanitation plan. Poultry-management points, including brooder-house equipment and sanitation, proper heating and ventilation, proper feeding. Types of feed and care in proper growing plans. Considerable advertising, but some good general information on care of poultry, particularly of chicks.

**Full Egg Baskets** (Allied Mills, sd, about 100 frames, 25 min, loan). Correct layer management and the Wayne feeding program for layers and for hatching eggs. Discusses laying house—arrangement, sanitation, equipment, floor space, and lighting. Indicates care of layers—culling, ventilation, outdoor range, causes



of fall mots. Feeding program in detail with reasons for use of different types of feed. Considerable advertising for Wayne feeds, but good information on care of laying flocks.

**Grading and Packing Turkeys According to U. S. Standards** (USDA, No. 574, si, 49 frames, lecture notes). Classification of turkeys by age and sex into four classes; application of the four U. S. standard grades to each class. Information concerning proper packing methods to retain grade value during shipment, with examples of good and poor packs. "Preparing Turkeys for Market" and "Turkey Marketing Today," described below, may be used with this strip for more complete unit on turkey marketing.

**Marketing of Eggs in the United States** (USDA, No. 271, si, 52 frames, lecture notes). Discusses eggs as half-billion dollar industry with New York as leading egg market. Methods of transportation used; candling, weighing, grading, packing, and storing methods. Explains four principal U. S. grades of eggs.

**National Poultry Improvement Plan** (USDA, No. 413, si, 4 frames, lecture notes). Explanation of objectives of the plan; to improve breeding; to reduce mortality; to develop uniform terminology. Methods by which flock owners can participate in the plan; how flocks may meet requirements of the three pullorum-control classes, and the five progressive breeding stages.

**Preparing Turkeys for Market** (USDA, No. 571, si, 44 frames, lecture notes). Information on preparation of turkeys, including inspection of live birds, handling of live birds, proper dressing and equipment needed, steps in wrapping, cooling, picking, packing, and shipping.

**Production and Marketing of Quality Eggs** (USDA, si, 45 frames, lecture notes). Procedures in proper production and marketing eggs, including correct gathering and cooling, packing, keeping eggs clean, packing methods, frequency of delivery, necessity of confining rooster, handling by dealer, candling, grading, selling in retail stores, care of eggs in the home. U. S. standard grades indicated.

**Raising Baby Chicks** (Ralston-Purina, si, 47 frames, loan). Points to consider in buying good chicks, in getting ready for care of chicks, in planning feeding program, in growing pullets to layers by either range or confinement method. Stresses importance of proper feed. Considerable advertising of Purina products. Information similar to that in "From Chicks to \$\$\$" described above.

**Selecting Hens for Egg Production** (USDA, No. 126, si, 50 frames, lecture notes). Examples of good and poor layers of various breeds. Methods of determining whether a hen is a layer or nonlayer. Points out how molting and bleaching index egg production. Information on improvement of flock by selecting and breeding.

**Standard Breeds of Poultry** (USDA, No. 133, si, 47 frames, lecture notes). Standard breeds, showing both male and female. Diagrams naming parts of fowls. Ends with a few specimens of breeds of geese, ducks, and turkeys.

**Successful Turkey Raising** (Ralston-Purina, si, 49 frames, loan). Information on price spread between grades of turkeys and the four important marketing times for turkeys. Points in selecting poults, in selecting breeder, and in getting disease control. Discusses equipment, housing, sanitation, and feeding. Advertising for Purina products, but good general information on turkey-raising methods.

**Tables, Graphs, and Charts Relating to Poultry Production** (Nasco, No. SF. 70, si, 57 frames). More than fifty charts, graphs, and tables presenting information on various phases of poultry raising. Some of the topics included are equipment requirements; exterior and interior qualities of eggs; U. S. egg standards; effects of temperature; relation of production to costs and profits; calculation of cost of eggs and necessary selling price; characteristics of layers and nonlayers; selection calendar; dressing percentages for different classes of poultry; feed consumption; nutrient tables; rations. Excellent source material for instructors in vocational agriculture.

**Turkey Marketing Today** (USDA, No. 575, si, 47 frames, lecture notes). Contrasts old and modern marketing methods. Work done at government grading schools, procedures in inspection, and various types of packing. Scenes of New York markets and wholesale houses. Examples of advertisements for graded turkeys. May be used with "Preparing Turkeys for Market" and "Grading and Packing Turkeys," described above, for more complete unit on turkey marketing.

**Waste Weasels** (Allied Mills, sd, 15 min, loan). Discussion of methods of eliminating wasteful practices in producing eggs, milk, and meat on the farm. Radio lecturer steps from farmer's radio to survey his farm and locate wasteful practices, called "waste weasels" in the strip. Types of waste: in feed-storage shed; in dairy barn; in poultry feeding and watering; in hog feeding. Emphasis on having good, properly bred animals and birds to begin with. Growth goals indicated. Stresses need to reduce mortality and indicates methods. Only advertising is one feed trough labeled "Wayne Feeds."

**Retail Marketing of Live Poultry in New York City** (USDA, No. 250, si, 39 frames, lecture notes). Information concerning amount of poultry sold daily and annually, methods of transportation to city, care in transit, inspection, weighing, and kosher-slaughtering methods. Scenes of several markets; work of poultry pullers; retail markets. Very general data; photographs tend to be dark and show little detail.



## **SHEEP AND WOOL**

**Breeds of Sheep** (USDA, No. 141, si, 56 frames, lecture notes). Photographs of typical examples of several breeds of sheep and their classification on basis of fine, medium, coarse, and Karakul wool.

**Preparation of Wool for Market** (USDA, No. 275, si, 43 frames, lecture notes). Methods of shearing according to size of flock; approved twines and how fleeces should be tied. Government forms of wool-grade standards. Stresses importance of keeping wool clean and attractive, using clean sacks for shipment.

**Shearing Sheep** (Univ. Ill., si, 65 frames). Complete outline of shearing methods. Preparing to shear—details of arrangement of equipment and shearing area. Preparation of the sheep; proper position of sheep. Shearing procedures—spacing, sequence of strokes, position of shearer's feet, order in which sections should be sheared, appearance of properly shorn sheep. Step-by-step procedure for tying the fleece. Review and emphasis of important points. Very good factual presentation of shearing methods for agricultural courses or adult groups. To be of greatest value might be used with a demonstration or with practice shearing.

**Sheep and Wool** (Stillfilm, si, 30 frames). General survey of industry, including the following: uses of sheep products; wild sheep and their habitat; mutton and wool types of domestic breeds and characteristics of each; need for cleanliness in care of sheep; dipping; types of wool breeds; shearing; sorting of wool; shipment to factories. Mainly concerned with the wool breeds and wool production. Suitable for upper elementary or junior high school classes.

**Sheep Shearing** (Castle, made by USOE, No. OE-456, si, manual). Designed for use with motion picture of same title, but may be used separately for review purposes or as discussion guide. The following are presented through photographs and questions: handling sheep for shearing; positions of shearer and sheep during shearing; step-by-step procedure; method of rolling and tying fleece; types of shearing equipment.

## **SWINE PRODUCTION**

**Breeds of Swine** (USDA, No. 44, si, 34 frames, lecture notes). Several types and breeds of swine commonly used in market hog production in the United States. Lard and bacon types compared.

**Hog Houses and Equipment** (USDA, No. 53, si, 28 frames, lecture notes). Illustrations of farrowing houses; arrangements of A-type and box-type houses; general hog shelter. Examples of equipment, including loading chutes, feeders, dipping vat, waterer, breeding crate, concrete wallow and hurdle. Some information on construction.

**Pig Can't Shoot** (USDA, No. 627, si, 61 frames, lecture notes). General outline of swine production, stressing certain points to be observed for increased production. Covers breeding, sanitation, feed, pasturage, shelter, and marketing information. Aimed at increased production to meet wartime needs. Much information of value to classes studying swine production in spite of its definite emphasis on wartime production.

**Selecting and Judging Breeding Hogs** (USDA, No. 142, si, 29 frames, lecture notes). Points to be observed in scoring various parts of the two types of hogs (lard and bacon types). Illustrates both good and bad points of each type.

**Sow to Pig to Packer** (Ralston-Purina, si, 63 frames, loan). Summary of important points in swine management, emphasizing need of planning, common sense, hard work, proper care, and good program. Outlines the Purina program of swine management from breeding to fattening for market, including data on housing, equipment, proper sanitation, keeping of records, vaccination, worming, and feeding requirements. Contains advertising, but good information on swine management.

**Tables, Graphs, and Charts Relating to Swine Production** (Nasco, No. SF. 62, si, 36 frames). More than thirty charts, graphs, and tables on various phases of swine production. Some of the topics included are causes of pig losses from farrowing to weaning; nutrient requirements; feeding methods and rations; pasture; crossbreeding; survival ability of purebred and crossbred pigs; weaning weights; average daily gains. Good reference material for instructors in vocational agriculture.

## DISEASES AND INSECT PESTS

**Brucellosis of Cattle** (Bang's Disease) (USDA, No. 632, si, 47 frames). History of the spread of this disease; beginnings of Federal and state control; discovery of organism by Bang. Symptoms and causes of the disease outlined and illustrated. Methods of testing and control methods indicated.

**Cattle Grubs or Heel Flies** (USDA, No. 637, si, 32 frames, lecture notes). Seasonal and life cycles; methods of attack on cattle and their defenses. Maps showing distribution of cattle grubs in United States. Control methods for farm and range herds.

**Control External Parasites of Swine** (Nasco, No. SF. 61, si, 43 frames). Definition of external parasites and how they lower hog profits. Damage caused by lice and mange mites. Life cycles, appearance, prevention methods, treatment, and precautions. Practical information for agriculture classes and adult groups.



**Control Mastitis of Dairy Cattle** (Nasco, No. SF, 50, si, 51 frames). Explanation of mastitis, milk losses caused, effect on human health. Prevention by good management practices presented in detail. Diagnosis of mastitis; barn tests and laboratory tests; treatment. Detailed information including technical data on mastitis. Suitable for advanced agricultural courses and veterinary training.

**Control Roundworms of Hogs** (Nasco, No. SF, 60, si, 63 frames). Reasons for practicing swine sanitation. Life cycle of roundworm shown in detail. Control methods. How roundworms cause damage. Results of swine sanitation programs.

**Control Stomach and Nodular Worms of Sheep** (Nasco, No. SF, 130, si, 49 frames). Reasons for control; effects of worm infestation. Life cycle and sources of infestation. Control methods and treatments. Use of phenothiazine. Details of control program; importance of good pasture management. Effects of proper treatment on infested sheep.

**Eradicating Tuberculosis from Livestock and Poultry** (USDA, No. 515, si, 35 frames, lecture notes). Types of tubercle bacilli that cause disease in farm animals; examples of animals that are tuberculin tested; effects of the disease and prevention methods.

**Hog Cholera Control** (USDA, si, 38 frames, lecture notes). Losses due to cholera; chart of cholera symptoms; effects on animal's internal organs. Equipment and methods for inoculation and serum treatments. Prevention methods with emphasis on clean surroundings and proper sanitation.

**Horse Bots and How to Fight Them** (USDA, No. 405, si, 37 frames, lecture notes). Life cycles of the three types of bots—common, throat, and nose. Attack on horses and animals' methods of defense. Illustrations of effect of bots. Devices for protecting horses from the flies and methods of bot control through community action.

**Mineral Hunger in Livestock** (Nat'l Fertilizer Assoc., si, 55 frames, Pamphlet 129 available, loan). Needs of livestock for minerals; causes of mineral deficiency. Photographs of animals with marked deficiency. Symptoms, disease, and effects of deficiency. Experiments in supplying minerals through fertilized pastures and feeds. Importance of salt.

**Roundworms and Swine Sanitation** (USDA, si, 31 frames, lecture notes). Unsanitary lots as breeding places for roundworms. Route of worm through hog's body illustrated. Symptoms and effects. Sanitary measures for roundworm control.

**Trichinosis, a Disease Easily Prevented** (USDA, No. 573, si, 30 frames, lecture notes). Stages of the parasite; causes of the disease; its spread and methods of prevention. Stresses importance of understanding of trichinosis for human health and necessity for proper cooking of pork and pork products.

## CROPS

### Field, Garden, and Orchard

#### FIELD CROPS

**Cane Sugar** (Stillfilm, No. A-4, si, 24 frames). General information on raising of sugar cane, mainly in Cuba and Java; processes in sugar mills. Very general survey suitable for upper elementary grades.

**Conditioning and Cleaning Seed Cotton** (USDA, No. 512, si, 61 frames, lecture notes). Drawings and photographs showing methods of drying and types of cleaning equipment. Stresses importance of proper picking and drying to maintain value.

**Corn** (Stillfilm, No. A-8, si, 32 frames). General survey of corn industry in the United States. Includes type of plant, climate requirements, varieties, seed-corn testing methods, soil preparation and harvesting, uses as fodder and in silage. Suitable for elementary grades; provides general information.

**Cotton** (Stillfilm, si, 30 frames). General survey of cotton industry; map of world producing areas. Includes soil preparation, growth of plant, cultivation, picking, baling and ginning, varieties raised in the United States, use of cotton seed. Suitable for upper elementary grades, general information only.

**Cotton Classing and Market News Services** (USDA, No. 610, si, 42 frames, lecture notes). Brief summary of marketing methods prior to standard cotton classification. Explains values of modern classing and market services. Outlines proper method of sampling bales and packing samples for shipment, followed by views of expert classers grading samples. Use of cotton-classing report by farmer. Market news available from gins and its assistance to farmers.

**Determining Fertilizer Needs from Soil Tests** (Nasco, No. SF. 101, si, 95 frames, double-frame). Indicates in detail reading of soil tests and interpretation of test results—determining amount of limestone, rock, phosphate, nitrate of potash, potassium, and time of application. Estimating amount of increase when applications are made, indicating estimates of percentage yields in terms of crop yields. Many field maps and tables; practical problems for student solution. Excellent source material for laboratory test application.

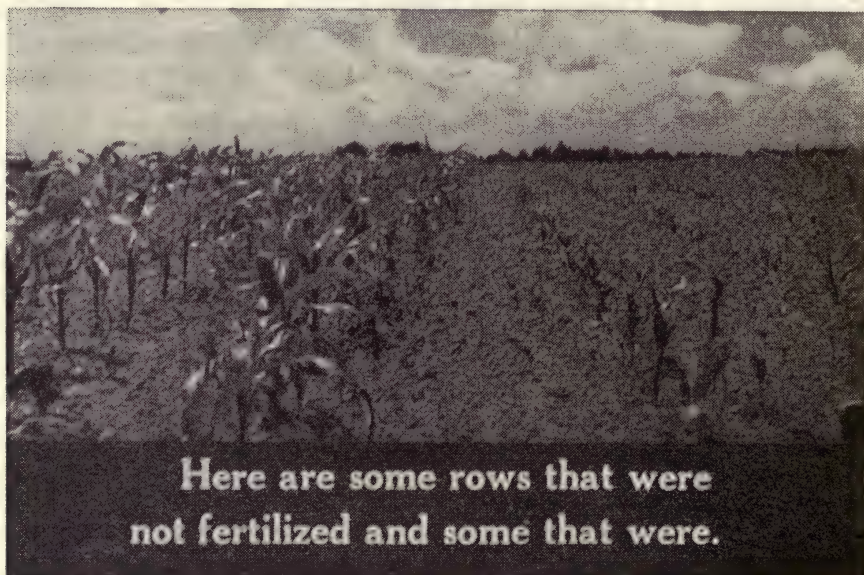
**Equipment and Practices that Reduce Hay Costs on Hay Farms** (USDA, No. 601, si, 64 frames, lecture notes). Stresses need to cut production costs, indicating efficient practices and equipment to bring down costs and maintain high quality of hay where a large crop is grown. Recommendations made for each step in hay production.

**Equipment and Practices that Reduce Hay Making Costs on Small Farms**



(USDA, No. 602, si, 46 frames, lecture notes). Improved practices and equipment recommended for use in hay production on small farms. Suggests use of horsepower rather than tractors or power equipment.

**Gins and Ginning** (USDA, No. 513, si, 55 frames, lecture notes). Outline of progressive improvements in ginning devices from primitive to modern. Indicates methods used in modern ginning and how these methods affect value of the lint.



From filmstrip "Putting Plant Food to Work." (*National Fertilizer Association.*)

**Green Acres** (Nat'l Fertilizer Assoc., si, 49 frames, Pamphlet 118 available, loan). Stresses importance of pasture in stock feeding and needs for pasture improvement. Experiments in pasture improvement and their results, comparing fertilized and unfertilized pastures. Indicates increase of milk and meat production, more feeds, surplus for hay or silage and prevention of soil erosion as results of improved pastures. Shows procedures for fertilizing. Discusses supplementary pastures, dangers of over- or undergrazing. Good information concerning fertilizing methods and needs for adult groups or agricultural courses. Captioned photographs with some text frames.

**Hay Quality: Relation to Production Practices and Feed Value** (USDA, No. 498, si, 56 frames, lecture notes). Stresses importance of hay quality in economical production of livestock and livestock products. Shows various steps

in proper production, handling, and storage of hay. Chart indicates amount of hay required for feeding purposes.

**Methods of Selfing and Crossing Corn** (Nasco, No. SF. 90, si, 51 frames, double-frame). Reproduction habits of corn explained. Cross-pollination and self-pollination explained. Flowering parts and order of blooming. Controlling pollination; procedures in bagging and pollination. Definition and procedures for selfing, interplant pollination, composite pollination, large-scale crossing, making single and double crosses. Excellent factual material on pollination control methods, suitable for advanced agricultural courses. May interest botany courses as supplementary material. Considerable text.

**Oregon Flax** (Stillfilm, No. G-109, si, 30 frames). Flax-raising industry of Willamette Valley; map of area. Includes type of flax, fieldworkers, use of machines, the fields, harvesting processes, extent of crop raised, threshing, retting, fiber-processing plant, linen mill, uses of seed. General survey suitable for use in elementary grades as supplementary material.

**Pasture Improvement** (Nasco, No. SF. 80, si, 57 frames, double-frame). Opens with reasons for pasture-improvement programs. Five steps in pasture improvement presented in detail; testing and treating the soil; preparation of seedbed; reseeding; controlling grazing; clipping weeds. Purposes of each step. Types of test; material used in treatment of soil; types of seed and methods of seeding. Considerable text, but good, practical data on improvement methods and needs.

**Production of Alfalfa East of the 95th Meridian** (USDA, No. 20, si, 56 frames, lecture notes). Procedures in production of alfalfa hay and alfalfa seed, indicating also effect of lime, phosphate, and manure; methods of inoculation and formula for neutralizing soil acidity. Discusses values of alfalfa both as feed and as replacement crop.

**Putting Plantfood to Work** (Nat'l Fertilizer Assoc., si, 50 frames, Pamphlet 131 available, loan). Development of fertilizer application methods, including hand application and several types of machines. Study and experiments conducted in proper application methods. Results of experiments. Effect of contact of fertilizer and plant seed; proper placement in relation to seed for several types of crops. Available in two editions—one for Northern states or areas and one for Southern.

**Red-Clover Production** (USDA, No. 383, si, 30 frames, lecture notes). The main causes of clover failures, indicating remedy through proper rotation, suitable soil, proper seedbed, control of fungus disease, control of insects, proper cutting and drying of hay, adapted seed, several standard varieties.

**Testing Soils for Acidity, Phosphorus and Potassium** (Nasco, No. SF. 100, si, 60 frames, double-frame). Shows methods of collecting and preparing soil



samples for testing and of testing for acidity, for phosphorus, and for potassium according to approved Illinois method. Step-by-step procedures and equipment required for each type of testing. Each section ends with brief test review. Designed for use in conjunction with laboratory exercises; recommends that students perform tests as film is shown or immediately following pertinent sequence. Presents procedure clearly and indicates methods of reading the tests. May be followed by filmstrip "Determining Fertilizer Needs From Soil Tests," described above.

**Treat Seed Grain** (USDA, No. 459, si, 55 frames, lecture notes). Diseases of cereal seeds and how they are spread, indicating methods of prevention by cleaning and treating of seed grain. Includes diseases that affect wheat, oats, barley, sorghum, and corn.

**Using Superphosphate with Manure** (Nat'l Fertilizer Assoc., si, 44 frames, Pamphlet 132 available, loan). Importance of saving and utilizing farm manures; methods of adding superphosphate to manure; increased fertilizing value for crops and pastures. Includes charts showing plant-food content of manures, pointing out that manure is not always a balanced fertilizer. Although this strip urges use of superphosphate and commercial fertilizers, it contains good material for agricultural classes.

**Wheat** (Stillfilm, No. A-7, si, 28 frames). General survey of wheat raising in United States, including climate requirements, areas where raised, varieties and cross-breeding; planting, harvesting, and threshing. Some data on primitive methods mentioned in text frames. Indicates uses of wheat. Suitable for elementary grades.

## FRUITS AND VEGETABLES

**Apples** (Stillfilm, No. A-13, si, 30 frames). General survey of apple industry: economic value in temperate regions; data re trees, appearance and type; grafting methods; starting an apple orchard; pruning; cover crops; thinning; tree diseases; worm prevention; popular market varieties. Some good material on apple-orchard production. Suitable for use in upper elementary grades or junior high school.

**Back-yard Vegetable Garden** (USDA, No. 657, si, 60 frames, lecture notes). Processes in growing vegetables in small plot, including selecting site, planning garden, preparation of ground, planting, thinning, staking, cultivating, irrigating, and succession cropping. Information on making compost.

**Citrus Fruits** (Stillfilm, No. A-10, si, 32 frames). Survey of citrus industry, including origin of citrus trees; most commonly marketed fruits; description and photographs of fruits, groves, and blossoms; climate and soil requirements;

frost and insect protection; packing houses. Suitable for use in elementary grades.

**The Farm Garden** (USDA, si, 68 frames). Activities required in gardening from soil preparation and cold frames to harvesting, storage, and preservation.

**Gardening Cartoons** (USDA, No. 633, si, 16 double frames, copy of *Consumer's Guide*). A series of 12 cartoons from the Mar. 1, 1942, issue of



From filmstrip "Backyard Vegetable Garden." (*Agricultural Research Administration, USDA.*  
*Photo by W. J. Mead.*)

*Consumer's Guide*, presents the following "don'ts" for gardeners: Don't start what you can't finish; don't waste good seed on bad soil; don't work ground too soon; don't run rows up and down hill; don't use too much seed; don't plant too much of anything; don't let pole beans black out the beets; don't wield too heavy a hoe; don't spare the water; don't let the weed crop win; don't let the bugs beat you to it; don't let anything go to waste. Also suitable for elementary or junior high school classes interested in gardening projects. Frames must be projected horizontally, instead of usual vertical position.

**Gardening for Victory** (USDA, No. 634 and 635, si, Part I, 42 frames, Part II, 56 frames, lecture notes). Part I, "Planning and Planting the Farm Garden," shows a farm family working on a Victory garden. Work involved in planning, preparing potatoes for seed, plowing, use of cold frames, planting, and trans-



planting. Part II, "The Farm Garden Brings Results," shows the children of the family tending the garden, using hand cultivator, treating for insect pests, and weeding. Last sequences show scenes of harvesting, canning and storage, with close-ups of various vegetables with food content of each indicated. Designed specifically for the wartime gardening program, but includes material applicable to all gardening. More suitable for elementary and junior high school classes than for advanced agricultural courses.

**Grafting and Budding Fruit Trees** (USDA, No. 197, si, 34 frames, lecture notes). Photographs and drawings of the whip graft, cleft graft, and budding methods. Shows tools used for grafting and budding. Should be followed by actual demonstration or practice.

**Grapes and Raisins** (Stillfilm, No. A-14, si, 30 frames). General information concerning raising of grapes and preparation of raisins. Includes climate and soil requirements, average crop yields, and uses of grapes. Suitable for elementary grades.

**Home-grown Plants for Transplanting** (USDA, No. 656, si, 37 frames, lecture notes). Step-by-step operations and tricks of process of growing plants for setting out. Indicates advantages of growing own plants. Designed for Victory garden program but usable in any classes interested in this process.

**Making a Vegetable Garden** (Stillfilm, No. N-31, si, 30 frames). Views of children preparing and working in a school garden. Includes planning, clearing the plot, preparing soil, planting, and weeding. Lengthy text frames. May interest primary and lower elementary grades planning to start a school garden. No technical information included.

**The New Gardener** (USDA, No. 641, si, 48 frames, lecture notes). Outline for beginners of the main steps in gardening, including soil preparation, planting methods, transplanting, weeding, staking, and harvesting. Examples of good vegetable varieties. More suitable for school groups interested in gardening projects than for advanced agricultural courses.

**Pedigreed Potatoes** (Eye Gate, si, 45 frames). Scenes of activities and operations in raising potatoes on a ranch near Carbondale, Colorado. Includes inspection and treatment of seed potatoes, planting, cultivation, irrigation, harvesting with machines and by hand, sacking, and storage. Stresses importance of proper seed selection. Photographs include many long shots that do not show the operation clearly.

**Propagation of Trees and Shrubs by Vegetative Means** (USDA, No. 600, si, 47 frames, lecture notes). Indicates need of vegetative propagation to ensure true perpetuation. Proper use of stolons, layers, cuttings, grafts, buds, sprouts,

and rootstocks demonstrated. Equipment used and step-by-step processes in whip and tongue graft, cleft graft, and budding.

**Soil Erosion and Its Control in Orchards** (USDA, No. 611, si, 37 frames, lecture notes). Indicates causes of orchard erosion by gullyng and by drifting soil. Methods of controlling such erosion by gully treatment, terracing, strip cropping, straw mulching, contour planting, use of cover crops, and shelter belt.

**Stone Fruits** (Stillfilm, No. A-12, si, 30 frames). Part I deals with peach growing, including soil and climate, varieties, spraying, frost dangers, drying methods. Part II shows views of trees, orchards, and work with other fruits such as apricot, cherries, plums. Some data on marketing. Suitable for elementary grades as supplementary material only.

See also the following titles in the Economic and Industrial Geography section for supplementary, illustrative, and related material:

Desert Harvest

Growing and Marketing Fruit

Vegetable Growing for City Markets

Production of Tomatoes and Tomato Products

## CROP DISEASES AND INSECT PESTS

**Barberries in Grain Areas; Their Spread, Damage, and Eradication** (USDA, No. 564, si, 40 frames, lecture notes). Charts of spread of black stem rust from 1876 to present. Evidences of the rust; the life cycle, effects on yield and quality of grain. Eradication methods employed by trained crews demonstrated.

**Chinch Bugs and How They Are Controlled** (USDA, No. 551, si, 34 frames, lecture notes). Photographs and drawings showing life stages of the insect, its yearly cycle, indications of where bug may be found in different seasons, plants on which it feeds, damage done to crops. Control methods and equipment demonstrated.

**Cotton Flea Hopper and Its Control** (USDA, No. 584, si, 43 frames, lecture notes). Life stages of flea hopper, native plants on which it feeds, damage done to cotton crop, methods of control, and types of dusting equipment in use.

**Diseases of Cabbage and Related Crops** (USDA, No. 406, si, 51 frames, lecture notes). Indicates diseases that injure cabbage and related crops, showing causes and effects of these diseases and methods of control. Includes blackleg,



black rot, alternaria leaf spot, clubroot, wire stem, bottom rot, sclerotinia rot, downy mildew, bacterial leaf spot, tipburn, oedema.

**European Corn Borer and Its Control** (USDA, No. 589, si, 50 frames, lecture notes). Map of corn-borer infestation in United States. Life stages of insect; damages it causes. Demonstrations of control by natural enemies, by spraying and dusting, by clean harvesting and disposal of field refuse.



From filmstrip "European Corn Borer and Its Control." (*Bureau of Entomology and Plant Quarantine, USDA.*)

**The Farmers' Allies and Pests** (Eye Gate, si, 70 frames). Photographs of various insects: ladybird, life cycle and effect on green fly pest; the *Pieris brassicae*; wasps, mason bees, and mud-dauber bees. More suitable for elementary nature study than for agricultural courses.

**Grasshoppers and Their Control** (USDA, No. 360, si, 39 frames, lecture notes). Examples of different varieties including migratory, clear-winged, two-striped, red-legged, and Carolina grasshoppers. Indicates stages of their incomplete life cycle and damage done. Control by natural enemies and prepared bait discussed.

**The Hessian Fly and Its Control** (USDA, No. 407, si, 35 frames, lecture notes). Distribution of the fly in the United States, its life cycle, location during each month of the year, habits, and damages caused. Indicates control methods.

**Insect Pests of Garden Vegetables and Their Control** (USDA, No. 503, si, 61 frames, lecture notes). Life stages and plant injury of common insects of two general types as classified by mouth parts (biting-mouth and sucking-mouth types). Control methods by burning refuse; spraying and dusting demonstrated.

**Larger Barley Profits through Scab and Blight Control** (USDA, No. 355, si, 65 frames, lecture notes). Charts indicating barley production and use in the United States. Damage caused by blights. Effect of feeding blighted grain to livestock. Life history of causative fungi and methods of control.

**Nature of Plant Diseases** (USDA, No. 165, si, 46 frames, lecture notes). Structure and development of fungi; how fungus plants cause diseases of various parts of cultivated plants. Methods for control of fungi.

**The Pea Aphid: Its Importance, Habits, Enemies, and Control** (USDA, No. 521, si, 44 frames, lecture notes). Maps showing acreage of canning, dry and market peas, indicating extent of pea aphid as hazard in this industry. Life cycle of pea aphid and damage done to plants. Control by natural enemies, dusting, spraying, and fumigation.

## FARM BUILDINGS AND EQUIPMENT

**Bringing an Old Wisconsin Farmhouse Up to Date** (USDA, No. 354, si, 42 frames, lecture notes). Remodeling of an old timber house as done by its owners using lumber from their own woods. Inconveniences of original building; plans for remodeling; work done, including addition of three rooms and cellar, new front entrance, roof repair, finishing outside walls, interior remodeling. Outline of costs given. Strip produced in 1935.

**Convenient Storage Spaces, a Joy to the Farm Family** (USDA, No. 408, si, 60 frames, lecture notes). Needs of farm family for adequate storage space. Diagrams of various storage spaces such as closets—portable, chore clothes, linen, bathroom, sewing room, and cleaning. Kitchen-equipment storage, food storage, dining and living-room storage, bookcases, outdoor storage. Ends with floor plan of house well equipped with storage space. May also interest manual training classes.

**Electric Power Serves the Farm** (USDA, No. REA-2, si, 53 frames, lecture notes). Illustrates some of the uses of electricity on the farm: running water; irrigation; cattle watering; fire precaution and fighting; lighting, ironing, refrigeration, cooking, laundering, cleaning; uses for lighting barn and other structures, running various machines, and in farm repair work. General survey of uses of electricity with no technical information on methods.

**Farm Water Supply** (USDA, No. 104, si, 46 frames, lecture notes). Opens with diagrams of water cycle and list of sources of farm water. Methods by



which wells and surface water sources may become polluted. Information on proper well protection and location; construction of springhouses; methods of getting running water. Lists conveniences of running water on the farm. Cutaway diagram shows entire water system for the farmhouse.

**Highlights on Farm Lighting** (USDA, No. REA-8, si, 51 frames, lecture notes). Examples of good lighting in farm homes and buildings compared with inadequate or improper lighting, stressing necessity for having enough convenient outlets and switches. No technical information on wiring or installations.

**Repainting a Frame Building** (Castle, made by USOE, No. OE 460, si, manual). Designed for use with motion picture of same title, but may be used separately for review purposes or as discussion guide. Questions on important points in repainting of frame buildings: determining repairs needed before painting; estimating amount of paint; preparing building; setting up staging; preparing paints; applying prime and second coats; care of brushes, paint, and equipment.

**Running Water for the Farm** (USDA, No. REA-6, si, 41 frames, lecture notes). Inconveniences on farms without running water. Electrification as means of providing running water. Benefits and conveniences of running water: fire protection; home conveniences; economic benefits such as cooling of dairy products, watering and cleaning cattle, irrigation; use of running water in such community activities as school, lunchroom, or poultry plant.

**Rural Electrification** (ACE, No. 29, si, 44 frames, lecture notes). The needs for electricity on farms; provision of electrification; many uses and advantages. Sources of inexpensive electricity, such as windmills and dam projects.

**Use of Logs in Farm Buildings** (USDA, No. 648, si, 50 frames, lecture notes). Use of logs in building construction on the farm; need for careful chinking; photographs of structures built of logs to illustrate helpful suggestions on use of logs.

**Wired Hands for the Farm** (GE, sd, 60 frames, loan). Old inconveniences of farm compared with conveniences of modern, electrified farm, showing many types of electric equipment for use in home, in dairying, in truck or fruit growing. Merely indicates advantages of rural electrification and electric equipment; no technical information on installations.

**Wiring for the Farm** (GE, sd, 65 frames, loan). Farmer talking with contractor gets information on wiring. Indicates where the wires go from source and generating station to farm transformer. Compares wire with water pipe. Shows types of fuses, surface breakers, circuit breakers, fuse panels, switches, meter, fixtures, outlets, types of wires, conduits, and cables. Stresses need to select

reliable contractor, get good quality materials, and do complete wiring job at the start.

**Wiring Wisdom** (USDA, No. REA-7, si, 55 frames, lecture notes). Designed to show the need for adequate wiring of the right kind for farmhouses and buildings. Wiring diagrams compare adequate and inadequate wiring. Some locations for switches and outlets for convenience. Points out need for special wiring for heavy-duty purposes.

See also

Electrical Wiring

Use of the Square

## FARM MACHINERY

**The Blade of Fame** (Case, sd, about 40 min). A history of the development of the steel plow. Begins with Leonard Andrus's search for a place in which to settle and develop a prosperous community—selection of Grand Detour. Problems of settlement; development of community associations for improvement. Need for better plows. Work of Andrus and John Deere in developing steel moldboard plow. History of development of this plow, its improvements, and development of factory making the plows up to Centennial plow of 1937, ending with sequence giving advantages of this particular plow model. Although this strip is somewhat outdated, the history of plow development remains constant and may be of interest as supplementary material.

**Care and Repair of Farm Machinery** (USDA, No. 628, si, 48 frames). Series of illustrated charts concerning machinery care and repair including adjustment of guard parts, knife holders, wiring plates, lifting springs, bevel gears, wheels, hitch, tractor drawbar, alignment of mower bar and bar lead, removal of knife sections, wristpin replacement, flywheel replacement, and preventive maintenance. Each frame contains considerable information. Useful for reference but too much material for use as a whole in one class session.

**Ed Harvey and His Tractor** (Case, sd, 41 min, loan). The story of Ed Harvey, a farmer, who has just purchased a J. I. Case tractor, and the instructions given him by the tractor dealer. Information on use of instruction book; daily, weekly, and monthly checkup procedures; 2-year checkup in detail showing disassembly, adjustment, and assembly of parts. Although this strip deals with a J. I. Case tractor model not now manufactured, it may be of interest in discussions of methods of tractor maintenance. The film is very long and contains considerable advertising.



**Farm Work—Equipment Maintenance Series** (Castle, made by USOE, 6 films, si, manuals). Designed for use with the motion pictures of the same titles, but they may be used separately for review purposes or as discussion guides. Views of various operations with questions for class participation or



From filmstrip "The Blade of Fame." (*J. I. Case Co.*)

testing. Individual titles, with brief description of work covered by photographs and questions, follow.

**Reconditioning a Mower, Part I, Cutter Bar** (No. OE 194). Checking, reconditioning, and repairing cutter-bar mechanism; removing, replacing worn sections in sickle; sharpening sickle sections; repairing, sharpening, replacing, and straightening guard unit; replacing and adjusting knife clips and wearing plates; aligning ledger plates, cutter bar, and sickle.

**Reconditioning a Mower, Part II, Drive System** (No. OE 195). Removing wheel assembly; cleaning and lubricating parts; replacing worn pawls and springs; removing worn drive-shaft bearings and installing new bearings; removing, cleaning, and inspecting gear parts; replacing worn parts and reassembly of gears; lubrication.

**Reconditioning a Two-Bottom Tractor Plow** (No. OE 196). Checking, repairing, and maintaining two-bottom tractor plow, including wheel assemblies, power-lift assembly, plowshares, coulter, painting, checking, and adjusting furrow wheels in the field.

**Reconditioning a Grain Drill** (No. OE 197). Inspecting and cleaning grain drill; cleaning and lubricating fertilizer and seeding mechanism; inspection of seeding tubes, clutch, and driving mechanism; adjusting pressure springs; repair of disk-furrower openers, drive chains, and pawl assembly; calibrating the seeding mechanism.

**Reconditioning a Cultivator** (No. OE 453). Checking and replacing worn wheel boxing; lubrication; inspection and adjustment of yoke; checking and replacing evener parts and shovels; checking and lubricating gang expansion and steering assemblies.

**Care of a Tractor** (No. OE 454). Day-by-day operating care; importance of periodic inspections; operations in checkups; proper care of tires; adequate lubrication.

**Farm Work—Forging Series** (Castle, made by USOE, 3 filmstrips, si, manuals). Designed for use in conjunction with motion pictures of the same titles, but may be used independently, particularly for review purposes or as discussion guides. The filmstrips review information presented in the motion pictures, using photographs with question captions and some summary of important points. Individual titles are listed below with brief indication of subject matter reviewed.

**Forging with a Hand Forge** (No. OE 191). Cleaning tuyère and building an open fire in a forge; maintaining fire and coking the coal; layout and marking of stock; heating mild steel for forging; forging an eye.

**Forge Welding** (No. OE 192). Maintaining clean, deep, hot fire; heating mild steel for forging; how to upset and scarf round stock; making a lap weld; shaping and hammer refining the weld.

**Forge Hardening and Tempering Farm Tools** (No. OE 193). Heating carbon-steel tools for forge sharpening; sharpening procedures; hardening and tempering plowshare and cultivator shovel; identifying tempering colors.

**History and Development of Agricultural Implements and Machines** (USDA, No. 335, si, 54 frames, lecture notes). History and development of agricultural machinery from before 1850 to early 1900's, indicating three eras of human power, animal power, and mechanical power. Changes and developments in plows, planters, seeders, cultivators, harvesting, and threshing machinery.

**More from Your Mower** (Case, sd, about 20 min, 91 frames). Information on mowers, mower maintenance, use, and trouble shooting. Opens with statement of



importance of mowers in farming and factors in a good mowing job. Parts of a Case mower discussed in detail, showing how each contributes to proper mowing. Complete procedures for slack season checkup indicating methods of checking, aligning, tightening, and lubricating, and recognizing replacements required. Presents points for haying time: need to begin early, as soon as dew is dry; amount to cut daily; cutting for ease in raking; field checking and maintenance; tractor-engine speeds; safety precautions. Trouble-shooting section indicates possible causes of pulling too hard, ragged cutting, excessive vibration, uneven swathes, excessive side draft. Special equipment for special mowing jobs indicated. One sequence stresses selling points of the Case mower, although the name of the company is not mentioned. Machine parts are well shown with many close-ups; views of actual haying operations employ many medium shots where close-ups might have been more clear. Maintenance procedures may be helpful in vocational agriculture shop classes or for adult groups.

See also the Farm Machinery group (Salesmanship) and Common Types of Fractional Horsepower Motors for supplementary or related material.

## FORESTRY

**Arbor Day** (SVE, 31 frames, si, manual). Photographs with brief captions show the following: individual trees, trees on streets, around homes, in parks; the three major parts of a tree; cross section of trunk showing rings; effect of growth in forest or individually; uses of lumber; proper logging; fire precautions; nurseries for reseeding. Stress on trees for beauty, comfort, and protection. Title misleading as strip gives no information about Arbor Day itself. Very general information about trees. May interest elementary grades for use prior to Arbor Day observances.

**Chestnut Blight** (USDA, No. 199, si, 47 frames, lecture notes). Outlines the history of chestnut blight from its introduction into the United States until 1940, describing symptoms and causal fungus and extent of damage. Work of the U. S. Bureau of Plant Industry in its attempts to establish blight-resistant chestnut trees. Some indication of control methods.

**Community Forests, a Local Asset** (USDA, No. 604, si, 78 frames, lecture notes). Summarizes the values of a community forest, including profit, employment, and recreation.

**European Timber Trees: Selected Types and Their Characteristics** (Filmette, No. 55, si, 55 frames, guide). Photographs of forests and individual trees, with close-ups of foliage, trunks, and some cross sections of typical European timber

trees. Strip contains no captions nor text; the one-page guide provides information and identification. Suitable for use in upper elementary or high school forestry or botany classes. May interest college classes as supplementary material. Since the strip carries no text material, the information can be adjusted to class levels or requirements easily; also the uncaptioned photographs can be utilized for identification test material.



From filmstrip "Community Forests—A Local Asset." (U. S. Forest Service.)

**Facts about Our Forests** (SVE, 3 parts, si, manuals). General information concerning the forests of the United States, location of different types, forest products, and conservation. Suitable for elementary or junior high school classes. Individual titles listed below. No descriptions are included since the titles are self-explanatory.

**Part I—Forest Types of Eastern United States**

**Part II—Forest Types of Western United States**

**Part III—Products and Conservation**

**Famous Trees in the United States** (USDA, No. 507, si, 79 frames, lecture notes). Photographs of trees that commemorate events in history and life, including those notable for size, age, or unusual form and trees planted by early national leaders. Supplementary material for elementary grades.

**The Farm and the Farm Woods** (USDA, No. 662, si, 47 frames, lectures notes). Survey of values of farm woodlands, including home use for fence posts, heating,



and lumber; crops such as logs, turpentine, and lumber products. Some points of proper care and management.

**Farm Forestry Extension in the United States** (USDA, No. 393, si, 69 frames, lecture notes). Survey of work by state extension foresters and county agents in promoting proper care of farm woodlands. Illustrates benefits of such woodlands, including erosion control, shelter belts, windbreaks, wood for home use and for cash crops.

**Farm Forestry in the South** (USDA, No. 447, si, 69 frames, lecture notes). Outline of kinds of trees found in Southern stands, indicating uses of each. Information on home use, cash crops, and proper management.

**Farm Shelterbelts in the Plains Region** (USDA, No. 387, si, 48 frames, lecture notes). Examples of shelter belts and windbreaks indicating reasons for their placement. Methods by which shelter belts are established, proper care and maintenance, and benefits to be derived.

**Forest Botany** (SVE, si, 48 frames, manual). Photographs of various kinds of trees, natural environment of various types, identification of leaves and seed types. Information on protection methods and erosion control. Suitable for elementary or junior high school classes in nature study.

**Forest Conservation** (SVE, si, 48 frames, manual). Scenes of values and benefits of forests including various forest products. Effects of fires, floods, and erosion, overcutting and overgrazing. Work of forest rangers in conservation. Supplementary material for elementary grades.

**Forest Conservation** (USDA, No. 349, si, 75 frames, lecture notes). Value of forest products, protective value of forest cover, and recreation offered by forests. Outline ways in which the valuable resources of the forests have been used and abused. Stresses wise management for forest maintenance, illustrating main points in conservation methods. More specific information than strip of same title described immediately above.

**Forestry in Geography** (SVE, si, 49 frames, manual). Map of forest regions in the United States, followed by photographs of forests of different regions, emphasizing the various types of trees in each. Some of the values of forests, including lumbering, maple products, and erosion control. May be of interest in elementary geography as supplementary material. Requires information of type supplied in manual.

**Forestry and Human Welfare** (USDA, No. 506, si, 56 frames, lecture notes). Contributions of forests to grazing of livestock and game, water supply, and recreation. Graphs and mosaics of national forest assets, forest uses and abuses, conservation factors. Suitable for elementary and junior high school classes.

**Forestry and Nature Study** (SVE, si, 41 frames, manual). Photographs of various kinds of trees, flowers, branches, and leaves. Manual provides identification. Suitable for elementary grades.

**Forest Ranger** (ACE, No. 9, si, 49 frames, lecture notes). Summary of the work of the Forest Rangers, including such activities as planting trees, marking trees for lumbering, testing tree growth, scaling cut logs, making roads and trails, replanting eroded areas, assisting wildlife, locating and fighting fire. Lecture notes include information on how to become a forest ranger. Good summary of the work of rangers and the qualifications for becoming rangers. May also be of interest to vocational guidance groups.

**Forests of the United States** (ACE, No. 8, si, 48 frames, lecture notes). Survey of forests and their uses, from pioneer and colonial days to the present. Their many values to the first settlers, the ways in which forests were abused, and the effects of such abuse. Stresses need for forest conservation. Information on many modern uses for wood. Suitable also for high school classes in history and economic problems, as well as courses dealing with forestry problems. One of the better conservation filmstrips.

**Friends of the Trees** (SVE, si, 15 frames, manual). Photographs of Calosoma beetle, Thalesa Lunator, various woodpeckers, chickadee, nuthatch, vireo, cuckoo, and other birds. Manual contains information concerning ways in which each is a friend of trees. Supplementary material only. Very general unrelated information.

**The Life of a Tree** (SVE, si, 52 frames, manual). Uncaptioned photographs: trees in various locations; seeds, seedlings; tree rings indicating age; transplanted seedlings, young trees and trees of full growth; roots, bark types; effect of wind, storms, and fires. Organization follows no logical sequence in presenting information on "life" of a tree. Stresses conservation instead of botanical information, which the title seems to indicate.

**Manual Training and Forestry** (SVE, si, 48 frames, manual). Map of large forest areas in western United States, followed by scenes of various forest areas. Some lumbering activities and logging-mill work shown. Information very limited; does not supply data suggested by title.

**Our Forests and What They Mean to Us** (SVE, si, 51 frames, manual). Forest regions of the United States; photographs of various forests. Lumbering operations; various forest products; irrigation; water power; recreational facilities. Some scenes of denuded areas and effect on erosion. Need to maintain the forests. A very general survey of forest values, with major information in manual only. Strip not meaningful without information of type supplied by manual.



**Propagation of Plants** (SVE, si, 29 frames, maual). Drawings indicating reproduction by means of stolons and from bulb, seed, fern spore, shoots, grafting, nodes, tip layering, vine layering, rootstock mound. General information on propagation methods. Methods indicated, but processes not shown. May be of some interest as supplementary material in botany classes.

**Pruning Southern Pines** (USDA, No. 596, si, 63 frames, lecture notes). Reasons for pruning; illustrations of trees needing pruning. Information on time for pruning, methods, types of trees to prune. Results, pointing out improved value of logs from properly pruned trees.

**Saving Our White Pines from Blister Rust** (USDA, No. 370, si, 48 frames, lecture notes). Lists many uses of white pines. Causative fungus and its life cycle shown. Control methods outlined, stressing need to eliminate currant and gooseberry plants, which act as host to the fungus.

**Southern Pines Pay** (USDA, No. 595, si, 49 frames, lecture notes). Lists and illustrates uses of various types of pines adapted to Southern areas. Information on seeding by nature and by man, requirements of good timber farming, and values to farmer.

**Tree Planting on the Prairie Plains by Prairie States Forestry Project** (USDA, No. 508, si, 63 frames, lecture notes). Survey of shelter-belt planting in the prairie states and its values in soil protection, crop protection, values to game and livestock. Arrangement of shelter belt and requirements of successful tree planting and proper care.

**Various Damages Done to Wood and Wood Sicknesses** (Filmette, No. 53, si, 33 frames, guide provided). Photographs of various insects injurious to trees and of various tree diseases, showing resulting damage. Includes several types of beetle, moths, ants, rots, and fungi. One-page guide provides identification and information. Good for botany or forestry classes in senior high school or college.

See also the following series or individual titles for supplementary, illustrative, or related material.

Lumbering and Wood Products

Budding and Grafting

Forest Conservation

## SOIL CONSERVATION AND IRRIGATION

**Contoured Acres Fight** (USDA, No. 639, si, 29 frames). Stresses importance of farming on the level by means of contouring, to save water, fertilizer, and soil. Aimed at improved farm production for the war effort.

**Contour Furrows** (USDA, si, 31 frames, lecture notes). Soil protection on overgrazed and eroded pastures by use of white clover, grama grass, buffalo grass, and contour furrowing. Detailed explanation of methods used in furrowing, equipment used, and effects.

**Corn Belt Farmers Fight Erosion** (USDA, No. 572, si, 43 frames, lecture notes). Erosion-control methods used in the corn belt, including contour farming, terracing, rotation, planting, diversion drainage, and check dams.



From filmstrip "Soil Erosion in the United States." (*Soil Conservation Service, USDA.*)

**Diversion Terraces and Contour Strip Cropping** (USDA, No. 165, si, 48 frames, lecture notes). Methods of laying out and building diversion terraces, showing equipment to be used. Method of laying out and making contour strips. **Erosion Control on the Northern Great Plains** (USDA, si, 42 frames, lecture notes). Effects of plowing and overgrazing. Methods of erosion control including strip cropping, use of crop trash, terracing, revegetation of gullies, contour furrowing, windbreaks, strip fallowing, cover crops.

**Erosion Control in the North Atlantic States** (USDA, No. 426, si, 35 frames, lecture notes). Farming practices used in the North Atlantic states to control erosion, with emphasis on value of forests.

**Erosion Control in the Southeast** (USDA, si, 38 frames, lecture notes). Effects of erosion—making land useless, choking channels and reservoirs. Farming methods applicable to Southeast for erosion control.



**Establishment and Maintenance of Grassed Waterways** (USDA, No. 559, si, 29 frames, lecture notes). Destruction caused by gullies. Methods of sloping and seeding gullies to serve as waterways.

**Farm Woods, a Safe Crop for Steep Land: Upper Mississippi Valley** (USDA, No. 570, si, 31 frames, lecture notes). Practices to be avoided to prevent erosion. Practices to be employed to check erosion on farm woodlands.

**First Things First** (USDA, No. 640, si, 24 frames, lecture notes). Companion to "Contoured Acres Fight," described above. Shows how grassing of waterways controls erosion, directing runoff on lands of greater slope, compared with use of contouring to direct runoff on lands of gentle slope.

**Frontiers of Grass—Story of the Western Range** (USDA, No. 585, si, 69 frames, lecture notes). History of the development and decline of the Western range, showing the effects of railroads, market routes, increase in livestock industry. Work of the AAA in urging, promoting, and assisting in restoration and protection of grazing and watering places.

**Irrigation** (Stillfilm, No. A-5, si, 30 frames). General information concerning irrigation: definition, uses in producing vegetables on arid lands; methods including underground wells, use of dams and reservoirs, ditches and canals; preparation of soil for irrigation; irrigation by flooding fields, furrow method, overhead sprinkling; results of overirrigation or poor drainage; views of irrigated areas. Suitable for upper elementary classes in agriculture or social studies; may also interest classes in economic problems.

**Irrigation** (ACE, No. 31, si, 41 frames, lecture notes). The need for irrigation in the Great Plains; development of irrigation projects; construction of dams; use of irrigation and its results. Includes diagram of typical irrigation plan; methods employed by farmers. More advanced than strip described above. Suitable for high school classes in economic problems, agriculture, government, or civics.

**Reclamation—A Vital Industry** (SVE, si, 34 frames, manual). Scenes of various dams and irrigation projects and effects of irrigation on farms affected. Indicates areas still in need of irrigation. More suitable for elementary and junior high school classes than for advanced courses in agriculture. A very general survey of reclamation projects and needs.

**Soil Conservation** (ACE, No. 30, si, 51 frames, lecture notes). Products produced by soil, results of erosion, methods of erosion control, and soil conservation. Opening sequence discusses development of top soil and its importance in supplying foods, clothing, wood, etc. Top soil is perishable possession; its variations in depth and what is found beneath it. Lecture notes stress part played by government services. Suitable for high school agriculture, government

or civics, social studies, and economic problems classes. Also may interest vocational agriculture groups.

**Soil Conservation Benefits Wildlife** (USDA, No. 558, si, lecture notes). How nature reclaims areas saved by soil conservation, providing cover for game, fish, and other wildlife. For supplementary use.

**Soil and Water Conservation by the Beaver** (USDA, No. 502, si, 48 frames, lecture notes). History, habits, and economic relations of the beaver, with emphasis on reference to farm and forest lands. Methods of establishing new beaver colonies.

**Soil Erosion and Its Control in the Upper Mississippi Valley** (USDA, No. 463, si, 48 frames, lecture notes). Causes and extent of erosion in this area. Engineering and farming practices to hold rain water where it falls and to save soil.

**Soil Erosion in the United States** (USDA, No. 467, si, 47 frames, lecture notes). Discussion of erosion conditions in the United States in 1937, showing effects of man-made and natural erosion. Farming practices that cause erosion, showing effects. Map of erosion areas, graph of erosion extent, and statement of yearly destruction and effects upon crop yields. Outline of control methods.

**Story of Topsoil in the Northeast** (USDA, No. 520, si, 47 frames, lecture notes). Importance of topsoil. Practices that destroy topsoil, including unwise lumbering, grazing, and farming. Extent of erosion and topsoil loss in the Northeast. Erosion prevention methods outlined.

**Tree Planting and Land Use** (USDA, No. 620, si, 54 frames, lecture notes). Mistakes in land use that result in loss of yields and soil. Reclaiming ruined land with plantings adapted to sites. Proper care of such plantings.

**Wind Erosion—Its Control on the Southern Great Plains** (USDA, No. 456, si, 44 frames, lecture notes). Causes of wind erosion and its effects. Practices to prevent and control wind erosion, saving rainfall and soil.

## GENERAL

**Basketry, Another Home Industry** (USDA, No. 292, si, 48 frames, lecture notes). Illustrates how farm women and girls utilize native raw materials for making basketry articles for sale. May interest handicrafts groups also.

**The County Agent** (USDA, No. 654, si, 64 frames, lecture notes). Designed to acquaint those unfamiliar with the educational program of the U. S. Department of Agriculture with the county agent and his work. Describes agent's agricultural background and illustrates his activities in aiding farmers solve their problems.



**County Home Demonstration Agent** (USDA, No. 655, si, 64 frames). Designed to acquaint those unfamiliar with the educational program in home-making of the Department of Agriculture with the demonstration agent and her work. Describes her home economics background and characteristics and her activities in aiding farm women and girls to solve homemaking problems. Similar to "The County Agent" described above.



From filmstrip "Roadside Marketing." (USDA Extension Service. Photo by G. W. Ackerman.)

**Dust-Explosion Hazards in Fire Fighting** (USDA, No. 514, si, 48 frames, lecture notes). Conditions that cause dust explosions. How to avoid hazards and explosions in fire fighting.

**Finding Minutes** (USDA, No. 638, si, 43 frames, lecture notes). Drawings indicating ways in which time is wasted in farm homemaking; methods of planning work both indoors and out to provide for leisure time.

**Flower Gardens** (USDA, No. 500, si, 64 frames, lecture notes). Series of photographs of informal, formal, and special gardens. Designed to increase interest in farm flower gardens. No information on procedures.

**How to Get Rid of Rats** (USDA, No. 150, si, 51 frames, lecture notes). Information concerning losses in field and garden crops and in merchandise caused by rats. Control methods, including sanitary practices, screening, trapping, poisoning, gassing, ratproofing.

**Labor Efficiency on the Farm** (USDA, No. 630, si, 48 frames, lecture notes). Hints on methods of making best use of worktime by planning work. Indicates benefits: making work lighter, saving time and waste motion, handling of hired labor.

**Learning About Farm Jobs from Pictures** (USDA, No. 652, si, 50 frames, lecture notes). How pictures may be used with job instruction, suggesting the following: emphasize key points; discuss principal steps; show whole process; contrast right and wrong ways; compare two different methods; use pictures in connection with job instruction. May also interest vocational instructors, classes in foremanship and personnel management, or teacher training groups.

**Meat Cutting Series** (Castle, made by USOE, 2 filmstrips, si, manuals). Designed for use in conjunction with motion pictures of the same titles, but may be used independently, particularly for review purposes or as discussion guides. The filmstrips review information presented in the motion pictures, using photographs with question captions and some summary of important points. Titles are listed below with brief indication of subject matter reviewed.

**Cutting and Boning a Forequarter of Beef** (No. OE 456). Chilling beef; quartering; preparing for cutting; trimming the forequarter, cut wing, crosscut check, brisket, and chuck; preparing for freezing or canning.

**Cutting and Boning a Hindquarter of Beef** (No. OE 457). Chilling; removing hanging tender and kidney, cutting out flank; separating round; removing tenderloin, separating sirloin and rump from shell loin; preparing for freezing or canning.

**Pioneering a Permanent Country** (USDA, No. 567, si, 130 frames, lecture notes). Survey of main events that affected the welfare of farmers in the past 30 years; includes effect of erosion-control measures; dam projects and the First World War; decline following First World War; work of the AAA; decline after AAA is declared unconstitutional; new policy for permanent farming country to adjust the farming to changed conditions. May also interest classes studying economic problems.

**Planning Our Family Life** (USDA, No. 587, si, 59 frames, lecture notes). Solving everyday family problems cooperatively through sharing of all family members in planning for the farm and the home and its members.

**Prevent Farm Fires** (USDA, No. 642, si, 38 frames, lecture notes). Common fire hazards in farm homes and buildings; methods of eliminating them. Stresses carelessness as major cause of fires.

**Profitable Use of Farm Credit** (USDA, No. FCA-3, si, 56 frames, lecture notes). Indicates modern farmers' needs for more capital than needed by pioneer or homesteader. Outlines factors that influence farming and profitable production. Factors to be considered in determining amount of credit and the period of its wise use.

**Protecting Farm Manpower** (Univ. Ill., si, 56 frames, single frame or double frame). Opens with statistics on farm accidents, deaths, and injuries. Graphs



show percentages of accident causes. Presents examples of accidents caused by carelessness, such as carrying gun, standing under load of hay, having electric devices near water outlets. Causes of machinery accidents and preventive measures. Examples and preventive measures for animal accidents, falls, hand-tool accidents, fires, and explosions. Good general film on farm safety for agricultural courses dealing with farm management or for adult groups.

**Roadside Marketing** (USDA, No. 273, si, 58 frames, lecture notes). Photographs of various types of roadside markets from small units such as a simple bench to large stands. Proper position in relation to road; attractive display, signs, and advertising. Graphs showing the distribution of a day's sales, of a week's business, and of a year's business.

**Rugmaking, a Fireside Industry** (USDA, No. 264, si, 50 frames, lecture notes). History of how farm women and girls through influence of home-demonstration agents have become interested in reviving old art of rugmaking by utilizing home-dyed discarded materials. Development of home-industry shops and markets.

**Subterranean Termites and Their Control** (USDA, No. 420, si, 48 frames, lecture notes). Forms of the termites—their life cycle, and damages caused. Control measures by poisoning and by proper building construction.

See also the following series and individual titles for supplementary, illustrative, or related materials:

General Farming, Parts I and II

Cost of Poor Roads

Country Roadside Restored

Safe Water

Malaria

Food Preservation Series

Home Economics Group

# Business

Although courses dealing with subjects pertinent to the field of business have become increasingly popular in school curriculums, very few filmstrips have been produced for use in such courses, particularly in that area designated herein as "clerical." The wider selection of filmstrips available on salesmanship is due largely to their use by commercial companies for the training of sales personnel.

The available filmstrips on this subject have been grouped as (1) clerical—typewriting, bookkeeping, and similar subjects; (2) advertising; and (3) salesmanship. Specific contributions of the filmstrip in each of these areas include

*Clerical*—To show parts of machines, techniques, and forms to a large group at one time.

*Advertising*—To present sample advertisements to entire groups at one time for discussion and analysis.

*Salesmanship*—To present reenactments of actual sales situations; to demonstrate application of sales principles, and to illustrate the use of the voice.

## CLERICAL

Projected illustrations could aid the instructor of typewriting, shorthand, filing, bookkeeping, office management, and similar subjects; however, very little material is available for such use at present. The filmstrips which can be obtained are useful in demonstrations of the location, appearance, and operation of various parts of machines, particularly of those parts which are small and therefore cannot be readily seen on the actual machine by more than one or two students at the same time. Various business forms, methods of filling out these forms, and the appearance of business letters can also be shown rapidly and clearly in filmstrips.

**Accounting Series** (BEVA, 7 films, si). A detailed step-by-step approach to various phases of elementary accounting. Each strip includes motivation, reasons for the various steps, and problems for student solution. While the number of frames in each strip indicate great length, the strips are well organized for presentation by separate sequences if desired for class needs. Presentation of parts of forms used and of entries is well visualized—high lighting, arrows,



and similar devices being employed to concentrate attention upon the particular point under consideration. Four filmstrips of the series are described below. The other three strips, "Introduction to Accounting," "Accounting Cycle—Year-end Closing," and "Controlling Accounts," should be ready for release soon.



From filmstrip "Taking Dictation and Transcribing." (Gregg Publishing Co.)

**The Accounting Cycle—Direct Ledger Entry—Routine Each Month** (68 frames). Two familiar cycles—seasonal and business cycles. Definition of cycle. The accounting cycle outlined and analyzed: daily analysis of transactions and entry in books; monthly preparation of profit-and-loss statement and of balance sheet; yearly reports. Analysis of simple accounting cycle. Analysis of trial balance; rules on determining where trial balance and additional information belong; major parts of profit-and-loss statement. Method of preparing profit-and-loss statement. Preparation of balance sheet. Summary of cycle. Indications of accounting information needed.

**How to Balance Accounts** (106 frames). Reasons for balancing accounts. When accounts should be balanced—examples of daily, weekly, monthly, and yearly balancing requirements of specific businesses. Explanation of the meanings of "balance" in accounting. Method of balancing accounts. Prin-

ciple of balancing. Examples: balancing asset accounts, capital account, liability accounts; procedures and differences. Brief explanation of machine balancing and balancing of Boston ledger accounts.

**The Journal—First Lesson** (95 frames). Introduction—diaries and logs as methods of recording daily activities, and journal as recording of daily business transactions. Review of direct ledger entry: opening balance sheet; recording of cash, furniture, fixtures, notes payable, truck, capital. Disadvantages of direct ledger entry. Overcoming disadvantages by using journal; advantages of recording transactions in journal; explanation of journal form and of journalizing; sample entries and problems for students. Compound entry—definition and examples. Opening entry—definition, samples, differences from other entries, steps in making, problems. Summary.

**Posting—First Lesson** (One Journal—One Ledger) (76 frames). Definition and explanation of posting. Procedure in posting one journal entry. How to locate account page in alphabetical index of ledger. Difference in journal and ledger entries. Posting debit and credit accounts. Post-marking; method and reasons for doing. Order of posting. Importance of keeping all posting up to date. Summary. Problem in posting.

**Do You Know Your Typewriter** (SVE, si, 35 frames, manual). A study of various devices found on modern typewriters, such as variable line spacers, card attachments, bail rolls, tab set, tab clear keys, ribbon indicators, pressure regulators, tension lever, margin scale. Procedures for inserting paper, inserting stamped forms, labels and cards, use of knob for ruled lines, centering headings, ribbon changes. Shows Royal, L. C. Smith, and Remington machines. Well organized and clearly presented. Various sequences might be shown as needed either for presentation of a new procedure or for review, rather than showing entire strip at one time.

**Frailey Letter Clinic** (Dartnell, sd, 6 filmstrips, about 15 min each). The entire series shows Mr. Frailey, who conducts clinic on better business letter techniques, talking with Mr. Bates, a businessman whom he met on a train. Mr. Frailey discusses the fundamentals of good business letters, one fundamental being presented in each strip. Most of the pictorial material shows the two men talking or other businessmen at their desks, adding little to the instructive quality of the series. Several sequences show the two men in the club car with bottles of beer or in Mr. Bates' home with glasses of cordial. The end of each strip introduces the next in the series. Each strip opens with a summary of the preceding strips.

Information contained in the recordings is good, suitable for classes in business English either in high school or college. May also interest some typewriting



classes, to show contents and form of good letters, and business administration classes. Titles and brief descriptions follow.

**Relax—Be Natural—Just Talk** (No. 1). Importance of good letters to good will for entire firm; letters to be natural, friendly, and reveal personality of writer, acting as a personal representative talking to the reader. Suggests that executives read carbons of letters written by employees as basis for constructive criticism. Several poorly written letters shown with their results indicated.

**Shave Off the Whiskers** (No. 2). Need for eliminating stilted, old-fashioned phrases and using modern natural and friendly language. Examples of letters using outdated phrases and their effect on readers. Importance of simplicity, sincerity, and brevity.

**Don't Be a Goozler** (No. 3). "Goozling" as the use of long, flowery words, windy sentences, and redundancy. Effect of such letters on readers, stressing possibility of misunderstanding. Importance of simple words in concise sentences. Examples of both types given.

**Think Before You Write** (No. 4). The five steps in planning a letter: know your purpose in writing the letter; know the facts; visualize the reader and talk directly to him; find the arguments that will appeal most to the reader; use letter "carpentry"—putting selected points together in best possible sequence.

**The Star—The Chain—and the Hook** (No. 5). A formula for good letters: "Star"—good beginning to get attention. "Chain"—building desire and holding attention. "Hook"—getting action from the reader. Examples of methods of getting attention given.

**Things the Masters Know** (No. 6). Methods for writing better letters, such as collecting and studying best business letters received. Pointers for good sales letters: (1) Don't try to hammer too many points in one letter; (2) emphasize the point of difference; (3) beware of generalities; (4) avoid deception; (5) never humiliate or belittle. Ways in which letters may irritate or antagonize readers. Ends with review, emphasizing need to be friendly.

**History of the Typewriter** (Visual Sciences, No. S-2, si, 35 frames). Line drawings giving a résumé of the history of the typewriter, including the eighteenth-century attempts, first typing device, Burt's family letter press, and Progin's machine, nineteenth-century models, first commercial machines, shift-key machine, visible writing machine, early twentieth-century models, first type-bar machine, front-stroke visible writing machine, modern machines. Considerable text, which reduces legibility. Material may interest beginning typewriting classes as supplementary material.

**Taking Dictation and Transcribing** (Gregg, sd, 57 frames, 10 min, manual). Divided into two parts. Part I, "Taking Dictation"—proper procedures in taking dictation illustrated by Ruth Barrows, a new secretary to Mr. Hobbs, who has the reputation of being inconsiderate and cross. Includes taking materials into office, proper entry, position; use of pen instead of pencil; marking starting place for transcribing; interrupting dictator when necessary; dating of notebook, numbering letters, indicating changes and corrections. Part II, "Transcribing"—Advantages of proper type of desk, arrangement of transcribing materials and supplies; speeding up rush work; proper carbon insertion; file of often-used names and addresses; use of copyholder, proper typing position; proofreading letters in machine; arrangement of letters to be signed; making notes of reminders of things to do or to call to attention of employer.

Many useful hints and information suitable for shorthand or secretarial courses in high school or college. Pictorial material somewhat static, showing mainly Ruth and her employer seated at desks or talking, but includes close-ups of notebook, materials, etc. Manual includes entire script of recording so that filmstrip may be used silently with teacher commentary if desired.

## ADVERTISING

An important problem in teaching the subject of advertising is the presentation of appropriately chosen samples. Frequently, textbooks contain samples of advertising campaigns so out of date that the students will not have seen the campaign or know about the products advertised. In order to make the study of advertising more meaningful, it is highly desirable to use references to current advertisements as well as the illustrations that may be available in the text.

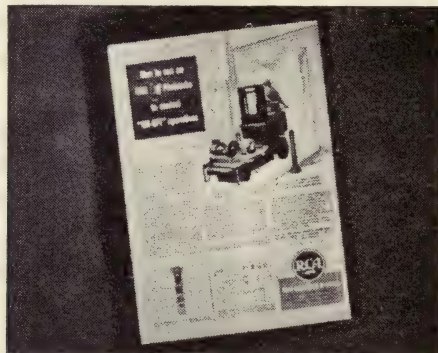
It is theoretically possible that such current advertisements could be made available in filmstrip form more quickly than they could be as a part of a printed book or pamphlet. Although tear sheets are used by many instructors, these sheets become dog-eared quickly and, frequently, are not large enough for the entire class to view during discussion. Consequently a means of projecting them is welcome. Sometimes tear sheets are projected on a screen with opaque projectors, but the material is much easier to handle if photographed as part of a filmstrip. The value of such material can be enhanced if close-ups of sections of an individual advertisement follow its presentation in entirety.

In spite of the obvious advantages of the filmstrip medium for the presentation of advertising samples, there are surprisingly few suitable strips available for teaching. However, this particular subject matter field is one suited to local improvisation of filmstrips. The strips listed below demonstrate several methods



of approach that the instructor may utilize in preparing materials for his own classes.

The improvised filmstrip is also applicable to projects in which students can be asked to assist in their production as a part of the course, providing an opportunity to meet several objectives in addition to the actual production itself. For example, a student asked to photograph the important points in a given advertising campaign automatically is required to familiarize himself with the information that he will later present to the class in filmstrip form. Furthermore,



Sample frame from "Four Years of Guest Reviewing." ("Electrical World.")

the selection of advertisements to be photographed will assist the student by forcing him to evaluate critically many possible samples, which perhaps might be gathered by the entire class.

Additional information in such filmstrips could include references to advertising campaigns which had been tested to determine which of two or more approaches had been best suited for the consumer group to be reached. Or such strips could be merely simple illustrations for specific lectures or class assignments. It is also possible to make filmstrips that are devoted to the technical requirements of advertisements, including samples of type faces, types of illustrations, use of headlines, layouts, and the use of color.

Instructors may also wish to use filmstrips listed under Salesmanship to demonstrate the interrelationship of advertising and selling. Those strips which deal with the selling of particular products will probably be most helpful as supplementary aids in the teaching of advertising.

**Four Years of Guest Reviewing** (Electrical World, sd, 30 min, color). A summary of readers' reviews of advertisements appearing in *The Electrical World*, explaining what readers like and dislike in technical advertisements. Presents the following four points as summary of what readers want: (1) Have

something to say; (2) keep it simple; (3) tell the story with pictures; (4) keep it professional. Indicates methods of surveying the field to learn what readers want to know, how to get the information, and methods of presenting the information. An excellent presentation of one type of advertising. Sample advertisements shown can also be utilized for fuller discussion of make-up, content, etc.

**Fundamentals of Rotogravure** (SVE, si, 22 frames, manual). Uncaptioned diagrams and photographs showing principles of rotogravure methods; procedures in photographing material to be reproduced; preparation of plates; printing. Information is supplied in the manual. Unless the instructor is familiar with the rotogravure processes, the strip cannot be used without the information supplied in the manual. The strip may be of interest to advertising and journalism classes as supplementary material indicating one reproduction method.

**The Magazine as an Advertising Medium** (SVE, si, 60 frames, manual). Examples of types of advertisements shown in such magazines as *Capper's Farmer, Field and Stream, Popular Mechanics, Collier's, Saturday Evening Post*, and others. Presents chart of fields covered by special-interest, vocational, and avocational publications. Some information concerning rates and buying circle of various media. Some of the sample advertisements shown are not legible. Title is misleading as the filmstrip does not present all the material necessary for a full survey of the magazine as an advertising medium.

**Marketing of Men's Shirts—a Case History** (SVE, si, 60 frames, manual). A history of the development of the advertising and distribution of Arrow shirts, showing the evolution of the product and of the advertising copy and layout. May be of interest to students of advertising to point out how styles in advertising copy and use of appeals change.

**The Newspaper as an Advertising Medium** (SVE, si, 50 frames). Opens with a study of values of newspapers to individuals, charts of newspaper distribution, and regional distribution maps. Latter half discusses values of newspaper advertising, illustrated with sample advertisements. Points out uses of newspaper advertising by department and retail stores, national advertisers, and classified advertisements. Many of the sample advertisements shown are difficult to read. Some information of interest to advertising classes, but does not give the complete story on newspaper advertising. May also interest classes in journalism.

**The Radio as an Advertising Medium** (SVE, si, 50 frames, manual). Mainly charts and graphs giving data on *Fortune* survey of favorite recreations; growth of population in United States; growth of telephone and radio use; number of radio sets in use; comparison of advertising versus editorial space in magazines, newspapers, and radio; analysis of network-program contents; expenditures of national advertisers in the five major media; contents of daytime and nighttime



radio programs; number of sets in use by half-hours; national ratings; station listening patterns; rate chart and network maps. Some of the material presented would be of interest in a study of radio advertising; however, it should be kept in mind that information of this type should be kept up to date to be of value to advertisers. Much of the graphic material is difficult to read.

**Seven Reasons Why Advertising Campaigns Fail** (Nat'l Industrial Advertisers Assoc., sd). Projected series to include 8 filmstrips of which 2 are available at this time. First strip in series introduces the "seven reasons." Subsequent filmstrips to discuss each of the seven reasons separately. Aimed at national advertising campaigns, but excellent material that could be adapted through discussion to other forms of advertising. Suitable for high school and college classes.

**Seven Reasons Why Advertising Campaigns Fail** (sd, 102 frames, 15 min, No. 1). Seven reasons for campaign failures, with brief discussion of main points: (1) Started campaign before getting data from manufacturing departments; (2) market determination not thorough; (3) didn't correlate with existing distribution channels; (4) inadequate appropriation; (5) budget loaded with items not really advertising; (6) didn't create kind of advertising that helped customers solve their problems; (7) failed to precede campaign by thorough training of sales force. Includes balloting device for audience to evaluate the reasons for failure in the light of some campaign which they had conducted. Designed for use by advertisers rather than students, but can be used in classes, particularly in college.

**Basic Procedures of Successful Market Determination** (No. 2, sd, 75 frames, 15 min). Brief résumé of film No. 1. Failure to make thorough market determination stressed as a major reason for campaign failures. Five fundamental procedures in good market determination, indicating methods of accomplishing each procedure, sources of information, and use of such information.

## SALESMANSHIP

The possibilities of the use of filmstrips as a teaching device in salesmanship classes have been forecast by their utilization by commercial companies to train salesmen and dealers. Most of the filmstrips available on this subject were produced specifically for such companies, rather than for school or college use; but a considerable percentage of these strips is readily adaptable to classroom needs.

Materials designed for the in-service training and improvement of sales-

personnel methods can assist the instructor in high school, college, and commercial school to bring to his students an understanding of successful selling principles and of their application to actual selling in the business world. It is often desirable that students (1) see and hear procedures in actual sales situations, and (2) observe demonstrations of the actual application of sales principles



From filmstrip "Tommy Fork and His Fountaineers." (*Syndicate Store Merchandiser, Inc.*)

studied. Both of these objectives can be obtained through the use of filmstrips that present examples of selling techniques in practice.

Since the use of the voice is an essential in selling, the sound filmstrip is more suitable for salesmanship classes than for courses such as mathematics. The sound filmstrips provide an opportunity to study the effect of voice tone, speed of delivery, inflection, enunciation, and methods of vocal emphasis, which would be impossible with a silent strip. Selection of words, organization of the sales talk, methods of meeting objections, and convincing presentation of selling points cannot be shown by pictures alone. However, pictures together with sound present the selling situation as a unit, indicating to the student the importance of the voice in selling while reminding him that the seller's manner, personality, and appearance must also be considered.

Salesmanship filmstrips may be divided into two groups, based on their



subject matter content. The first group includes filmstrips presenting general principles of salesmanship that are applicable to the selling of any product or service. These are closely allied to the classroom approach to merchandising, since the underlying principles are taught as a basis for selling in any field. The second group presents methods of selling specific products, having been produced explicitly for a company's sales forces or dealers. These films have value as supplementary aids, illustrating application of the principles of salesmanship to particular products. The available filmstrips described in this chapter are listed in these two groups.

### GENERAL PRINCIPLES OF SALESMANSHIP

**Behind the Counter** (Jam Handy, 5 films, sd, 10 min each, instructor's manual). Although designed for sales training in department stores and specialty shops, this series is suitable for any salesmanship courses that include the study of retail-selling methods. The individual strips deal with specific personality qualities desirable for sales personnel, indicating how each may be developed and applied in sales situations. The strips open with statements of the importance of the quality to both salesperson and to the store and end with a summary of points discussed and illustrated in the strip. Merchandise and departments shown in examples of techniques include only those which would be found in any department stores and most smaller retail stores, such as hosiery, gloves, men's and women's ready-to-wear, etc. The strips provide general information on retail-store selling techniques; however, some stores may have different policies on some points (such as the policy of selling a cheaper product because it better suits customer needs). These possibly controversial points may be pointed out and used as basis for detailed class discussion. Individual titles and brief descriptions follow, listed in order; however, the strips can be used in any order suited to class needs.

**Friendliness—Behind the Counter** (No. 1). Presents, discusses, and gives examples of the following five points: Welcome the customer; make the customer comfortable mentally and physically; have a friendly smile; mix respect with friendliness; show that you appreciate the business. Includes tests of friendliness and how to meet them. Both good and poor methods given.

**Attentiveness—Behind the Counter** (No. 2). Importance of getting attention and methods used in both ancient and modern times. Importance of giving attention. Following points presented, discussed, and illustrated with good and poor techniques: Look attentive; be attentive to all customers; be attentive for selling clues; be attentive throughout the sale.

**Helpfulness—Behind the Counter (No. 3).** Ways of helping discussed and examples given of each, showing both good and poor methods and effect on sales: meeting customers' needs; trading up merchandise by suggestion selling and by advising before they're ready to buy; giving services after the sale. Suggestion selling includes selling two of a kind, substitute selling, and selling related items. Importance of merchandise facts, where to get them, and how to use them.

**Sincerity—Behind the Counter (No. 4).** Effect of insincere sales talks on customers. Methods of proving sincerity discussed, illustrated with good and poor examples with effect on sales: Put the customer satisfaction first; be thorough in your sales talk; be accurate in your sales talk; keep your promises.

**Enthusiasm—Behind the Counter (No. 5).** Warning against high-pressure sales tactics. Following points with good and poor examples of each: Use knowledge of merchandise; talk and act enthusiastically; be enthusiastic from the customer's viewpoint; enthusiasm helping customers buy. Where to get merchandise facts and how to use them; importance of voice; letting customer handle the merchandise; displaying merchandise properly is also covered.

**Dale Carnegie Series** (Audivision, sd, 6 films, 15 min each, printed guide). The series is based on Dale Carnegie's book "How to Win Friends and Influence People," covering the principles of courtesy and tact in any situation that involves dealing with people. The films are applicable to the teaching of salesmanship although they are not designed specifically for selling. Each principle is illustrated by several examples from everyday life. Titles and brief descriptions follow.

**How to Gather Honey Instead of Stings.** Problem of criticism, indicating desirability of omitting criticism unless it is absolutely necessary.

**How to Get People to Like You.** Demonstrates effect of genuine, active interest in other people on their reactions to you.

**How to Make People Appreciate You.** Illustrates method of making people appreciate you by appreciating them.

**How to Make People Want to Cooperate.** How to influence cooperation by talking about what the other person wants, indicating how he can achieve his purposes by doing what you want.

**How to Win Your Arguments.** If an argument cannot be avoided, it can be handled tactfully and courteously, preventing unpleasant disagreement.

**How to Correct People's Mistakes without Making Them Sore.** Methods of praising before condemning, and of correcting mistakes indirectly. Emphasizes importance of correcting errors in private.



**Firing Line Series** (Audivision, sd, 12 films, 15 to 20 min each, manual). This series presents one sales principle in each strip, illustrating both correct and incorrect methods of application. The importance of each principle is stressed at the beginning of the strip. Various points pertinent to the principle under consideration are listed and illustrated by several examples. A testing device for self-analysis is incorporated in the strips for use in follow-up discussion. Humorous incidents and cartoons enliven the series and enhance the teaching values. Titles of the individual filmstrips follow with brief description of the principle covered in each.

**How to Lasso Your Prospect's Ear.** Successful methods of getting the prospect to listen with interest, and methods of capturing attention.

**How to Make Your Voice Help You Sell.** Recognizing and correcting the nine common weaknesses in the way people talk.

**How to Make a Demonstration Sell.** Methods of making more effective demonstrations.

**How to Make a Theme Song Help You Sell.** Concentrating on the one strongest appeal.

**How to Make Your Prospect Say "I See."** Methods of making the product's selling features clear to the prospect.

**How to Make Your Selling Points Add Up.** Combining the right sales points for the prospect.

**How to Make Your Reputation Help You Sell.** Seven ways of building up the kind of a reputation that helps a salesman sell.

**How to Take the "Ice" Out of "Price."** Methods of offsetting price resistances.

**How to Make a Question Clinch a Close.** One simple, but successful closing technique.

**How to Make a Lost Sale Pay a Profit.** Determining the principal reasons for one's lost sales, focusing attention on points to be reinforced.

**How to Make a Sale Stay Sold.** After-sale selling techniques.

**How to Sales Manage Your Selling Time.** Methods for effective utilization of salesman's time.

**Merchandising Training Films** (Syndicate Store Merchandiser, sd, 10 strips, 10 min each). Designed for sales training for retail-sales personnel, particularly in variety stores, but applicable to classroom use in any salesmanship courses that include a study of retail salesmanship. Suitable for high school and college classes or with adult groups. Some of the strips are also suitable for use in other courses as indicated in the individual descriptions.

**How to Teach a Job** (training handbook). Proper methods of instructing new employees, stressing the importance of taking time to teach the job properly. Four-step method demonstrated: (1) Preparation—need to prepare the trainee for learning. (2) Presentation—showing what to do, how to do it, and explaining why. (3) Application—letting trainee do the job while trainer watches, later making corrections and suggestions. (4) Examination—follow-up by checking back on learner. Suitable also for classes in personnel management. May interest groups in teacher training also.

**The Knack of Easy Wrapping** (wrapping handbook). Proper methods of using the three basic types of variety-store wrapping—the bag, the sheet wrap, and the sheet wrap with inner protection. Types of merchandise for which each wrap is best suited. Stresses keeping materials orderly and accessible and need to wrap neatly and securely without wasting supplies. Details on selection of size, wrapping oddly shaped items, and methods of using string and tape. Uses three cartoon characters, Billy the Bag, Sammy Sheet Wrap, and Inner Wrap Eddie. May interest home economics classes as supplementary material, since the same methods are applicable to wrapping of gifts or other packages in the home.

**Cash Registering Made Easy.** Correct operation of a cash register is told by an animated dollar bill. Includes proper step-by-step procedure in ringing up a sale; importance of ringing up the purchase before wrapping; handling sales of more than one item; use of tally sheet; refunds and exchanges; keeping enough change in the register; situations in which to call manager or floor supervisor; identifying counterfeit bills and coins. Ends with photo quiz presenting photographs in which errors are to be identified by the audience. The cash-registering methods shown are specifically those used by most variety stores, but the rules given may not apply in other situations.

**What It Takes.** Fundamentals of retail-selling jobs, particularly in variety stores, as taught to a new salesgirl. Includes introduction to store arrangement; importance of merchandise knowledge; keeping counter and understock orderly; good grooming; use of cash register and wrapping of packages; listening carefully to customer needs and serving them correctly; making suggestion sales; situation in which to call floor supervisor; importance of proper attitude toward job and customers. May also interest classes in personnel supervision.

**Fire Is Your Responsibility** (fire prevention check list). Rules for fire prevention in stores, stressing salesperson's responsibility. Opens with meaning of store fire to both owners and sales force; statistics on prevalence of various



causes of fires. Following causes listed with methods of prevention indicated: smoking; electric wiring; store housekeeping. Carelessness as major cause of fires. Ends with photo quiz in which viewers indicate possible fire causes shown in the photograph. May also interest other classes interested in safety education.

**Step into the Customer's Shoes.** Six basic rules of "friendly service" taught by a cash register to a salesgirl by forcing her to trade places with her customers and experience the effects of improper and unfriendly service. Includes prompt and courteous service; know what merchandise you have and display it; using merchandise facts and answering customer's questions; methods of making suggestions for related sales.

**Tommy Fork and His Fountaineers.** The fundamentals of food and fountain service presented by cartoon characters of silverware and dishes. Includes proper grooming; mechanics of good service; proper use of cash register; accident prevention, proper customer approach; methods of giving "extra" attentions; importance of cleanliness; proper handling of silverware and glasses; proper table setting; accuracy in taking orders and in making change; methods for saving steps. Ends with photo quiz in which serving errors are to be located by audience. Excellent information presented in interesting fashion. May also interest some home economics classes. Appropriate for personnel working in school lunchrooms also.

**The Case against Shrinkage.** A few of the common causes of "shrinkage" or merchandise shortages are pointed out to salesgirls by cartoon character Detective Ketchum. Includes shoplifting; care of understock and counter displays; handling of fragile merchandise; use of cash register; marking and checking prices; measuring and weighing; throwing away stock in nearly empty boxes, etc. Indicates amount of money lost annually through shrinkage and effect of loss of even one 10-cent item. Includes cartoon character of villain I. M. Shrinkage. Ends with review and a photo quiz in which viewers identify shrinkage causes. Although designed specifically for variety stores, can be adapted through discussion to other retail-sales situations.

**Handling Difficult Customers.** Some common types of difficult customers and methods which sales personnel should use to handle such customers. Includes customer who always finds something wrong, the impatient customer, the talkative customer, the "just-looking" type, the rude or angry customer, and methods of selling when two customers are shopping together. Emphasis on point that no customer is difficult if handled properly. Ends with photo quiz. Although designed specifically for variety stores, can be adapted to

other types of retail selling. May also be of interest to home economics classes, girls' or women's clubs to promote discussion of their own shopping habits.

**The Sale and How to Make It.** Designed to give the new salesgirl the "feel" of the sales floor before she begins selling. Told in story form: Mrs. Kelly, an irate customer, storms out of the store because of indifferent treatment received from salesgirl. This salesgirl is then guided through proper techniques of greeting customers, building a selling vocabulary, demonstrating, suggesting, dealing with undecided customers, substitute selling, and closing the sale so that the customer will want to return again. Ends with photo quiz. Although designed specifically for variety stores, it is suitable for use in any retail sales training.

**Modern Retail Salesmanship** (Dartnell, sd, 7 films, 7 to 10 min each, *Meeting Guide*). This series is designed specifically for retail-sales training. The fundamental principles are presented in story form as Mary helps her fiancé Tom, a salesman, to develop and improve his sales abilities. The series contains many references to their courtship and future marriage, but this does not interfere with the teaching values of the series for high school and college classes. Settings of the strips are in Mary's home, at cafés, on the street, and similar places. Titles and brief descriptions of the individual strips follow.

**The Record Breaker** (No. 1, 9 min). Discussion and illustration of the knack of meeting customers, stressing the importance of making every customer feel at home in the store, and illustrating methods of greeting, such as the merchandise approach and the acknowledgment technique of greeting waiting customers. Stresses importance of friendliness and display of courteous interest.

**How Do You Do?** (No. 2, 7 min). Stresses the need for making customers like you and getting them to return. Discussion of good sales personality, giving examples of proper and improper methods of handling various situations. Indicates need for politeness, cooperation with fellow workers, concealing your own feelings and irritations, and the use of tact.

**I'll Tell the World** (No. 3, 7 min). The importance of merchandise knowledge, stressing the need for the right answer to any customer question about merchandise. Sources of merchandise information and methods of using such information to dramatize selling points. Need to know where merchandise is located in the store.

**One Thing Leads to Another** (No. 4, 8 min). Methods of suggestion selling of related items with warnings against indiscriminate high-pressure "suggestions." Proper techniques illustrated: suggestions to increase value of purchase;



suggestions as a customer service; selling more expensive merchandise by "trading up"; getting customers to be value buyers instead of price buyers.

**Objection Overruled** (No. 5, 14 min). The six principal customer objections and methods by which each may be handled are demonstrated. Device uses a dream sequence in which Tom is being tried for improper handling of customer objection cases. The customer as witness presents the objection and Tom's method of meeting it; the judge indicates the rule Tom should have followed.

**The Close-Line** (No. 6, 8 min). How to get customers to decide and how to guide them to the close of a sale. Following points discussed and demonstrated: using winning arguments, narrowing down the selection, watching for buying signals, questioning on a closing detail, knowing when to stop selling. Warns against pushing the close too hard as the merchandise may be returned.

**Wake Up and Give** (No. 7, 8 min). Uses device of a Mr. Get and a Mr. Give at work in salesperson's mind, demonstrating why Mr. Give gets sales results. What customers are entitled to expect; how to get them to come back; methods of giving active assistance; giving interest and friendliness. A theme song "Wake Up and Give," which is also presented at the close of the strip in "community sing" arrangement for audience participation.

**Sales Training Series** (Modern Talking, sd, 3 films). The first two filmstrips in this series present basic principles in selling; the third discusses supervision of salesmen, but is included here as it may be of interest in advanced courses. Demonstrations of selling techniques apply the principles to various fields and varied merchandise. Titles with brief descriptions follow.

**How to Deliver a Sales Presentation** (30 min). Illustrates principles which make for successful public speaking and sales presentations, pointing out facts concerning presentations which salesmen should know and use.

**How to Make a Sales Point Hit** (30 min). Presents and demonstrates six fundamental methods of giving a selling point its greatest value.

**How to Supervise Salesman** (15 min). Eight methods for handling salesmen, indicating how the sales supervisor may lead, instead of drive, his men.

**Selling in America** (Jam Handy, 5 filmstrips, sd, 15 to 20 min each, manual). The series is based on Benjamin Franklin's principles of human association as applied to salesmanship. In each strip, Benjamin Franklin discusses one of his rules with a modern salesman, indicating both right and wrong applications of the rule. The series may also be used with the motion picture of the same title available from the same source. Individual titles and brief descriptions follow.

**Getting Them Talking** (No. 1, 60 frames). Illustrates methods of getting customers to talk by discussing their needs, asking leading questions, finding their interests.

**Being Agreeable** (No. 2, 80 frames). Discusses ways of being pleasant and helpful, suggesting instead of telling, selling at the right place, avoid arguments.

**Getting Together** (No. 3, 69 frames). Methods of handling objections by welcoming all objections and discovering the real objection. Emphasizes value of the "Yes, but—" answer.

**Keeping Your Neck In** (No. 4, 69 frames). Demonstrates principles of making suggestions tactfully, of showing merchandise asked for, of avoiding being too positive.

**Telling the Whole Story** (No. 5, 70 frames). How complete selling story aids in combating competition, reveals selling points, makes good use of time, bridges from point to point, and builds up the purchase.

**Strategy in Selling** (Dartnell, 7 films, sd or si, 10 to 25 min each, instructor's manual, sample set of training manuals). The series is organized in story form presenting the rise of Ed Thomas, salesman, from a failure to top man in his organization through study and application of selling principles as outlined in the Dartnell sales-training manuals. This device makes necessary introductory sequences in each strip, which do not add to the teaching value of the series. However, the story aids in maintaining the interest of the viewers. Each strip discusses one aspect of selling, presenting applicable principles through demonstration. Both right and wrong methods are illustrated. In each strip, Ed Thomas is shown studying the pertinent Dartnell manual, after which he applies the principles learned. Titles and a brief résumé of principles covered by each follow.

**Doubting Ed Thomas** (Planning Your Sales) (No. 1). Importance of getting background information before the initial call; methods of collecting such information; planning the sales visit to offer the customer something that is profitable to him.

**The Turning Point** (Getting Better Interviews) (No. 2). Methods of getting better results from interviews by giving the customer something when asking for the interview, prospecting for leads, holding attention, using questions properly, knowing the prospective buyer's problems.

**Let Him Smell the Coffee** (Making the Presentation) (No. 3). Emphasizes the need for the salesman to create desire. Stresses importance of showing actual product whenever possible, of presenting statistical material in chart form, and of pacing the presentation properly.



**A Thousand Times No** (Disposing of Objections) (No. 4). Methods of meeting objections, such as price too high, "things too unsettled at present," "I'll think it over," desire to buy from a company that uses the buyer's product. Ways of turning objections into selling points.

**In the Stretch** (Closing the Sale) (No. 5). Methods for bringing a sale to a successful close: closing on objections, suggesting items, using minor selling points, getting a third party to help close, giving the prospect a choice.

**A Price-Tag on Your Hours** (Managing Your Time) (No. 6). Methods of planning by the salesman to manage his time. Stresses routing, control records of time, watching size of territory, staying long enough but not too long, arranging appointments, using travel time.

**The Jack-pot—and How!** (The Way to Leadership) (No. 7). Ed Thomas at sales dinner wins bonus as top man in his organization. He is quizzed by other members of the sales force as to his methods. During this verbal quiz most of the important points covered in the preceding filmstrips are summarized and restated.

## SELLING SPECIFIC PRODUCTS

Methods for using filmstrips as supplementary aids are discussed in the chapter on filmstrip uses. Individual reports on filmstrips of the nature listed below may analyze the suggested selling methods or may present a comparison of selling methods shown in two filmstrips that deal with the same type of product.

Some of the available filmstrips in this group are listed and described here to indicate to the instructor their nature. It is usually also possible to secure other filmstrips showing sales methods from dealers in the community, particularly from those who handle such merchandise as refrigerators, automobiles, or agricultural machinery.

**Farm Machinery** (Case, 3 filmstrips). Methods used by J. I. Case Company dealers in selling various kinds of farm machinery. They may be used in high school or college classes to demonstrate use of selling points, effective presentations, handling of objections, and similar sales principles.

**Bill Barnes Buys a Mower** (32 frames, sd, 8 min). Two farmers during haying time discuss values, features, and advantages of the Case mower, stressing advantages in permitting cutting of hays such as alfalfa at proper time, thus increasing yield and profit. In this strip one farmer "sells" another, rather than a dealer making the presentation.

**Planting Corn for Profit** (sd, 15 min). Two farmers discussing the difference in their corn yield provide an opportunity for one to present values and advan-

tages of the Case corn planter. Includes information on proper use and care of the machine. Ends with brief sequence on Case drill planter, tractor two-row and four-row planters.

**Your Furrow Is Your Fortune** (sd, 15 min). A Case dealer takes a prospect on a tour to speak with various farmers using the Case Centennial plow. Each farmer indicates and demonstrates a number of the features and advantages of this plow. Includes information on needs for a good plow and the importance of proper plowing. Contains a thread of love-story interest between the prospect and a widow who runs two farms successfully.

**Where Furrows Begin** (about 20 min). Designed for dealer instruction, explaining in detail how dealer should (1) assemble and adjust the plow properly, (2) start it properly in the field, (3) instruct the owner in its care and operation, and (4) make follow-up call. Is concerned with the J. I. Case Centennial plow and its features. The sequence on proper care and maintenance by owner may interest vocational agriculture shop courses also.

**How to Drive a Woman Crazy** (Premier sd, 20 min, loan). A dealer demonstrates and explains advantages of the Premier vacuum cleaner to two women customers. Stresses desirability of purchasing from dealer instead of from an itinerant salesman. Designed for training of Premier salesmen but is usable in salesmanship classes to demonstrate selling techniques.

**Trailer-Tractor Series** (Fruehauf, 8 filmstrips, sd, loan). Designed either for showing to Fruehauf dealers to supply them with selling points and to demonstrate selling techniques or for dealers to show to prospects. These strips present good supplementary material for high school and college classes as they demonstrate various sales methods and uses of selling points.

**Wheel-marks on the Trails of Time** (sd, 8 min). First part discusses development of transportation from cave man's methods to present day, indicating that the "trailer principle" was applied throughout; stresses importance of this principle to civilization and development of commerce. Second part indicates the values of trailers. First part may also interest high school history classes or social studies groups. Suitable also for advertising classes to demonstrate one method of presenting selling points.

**Rationed Rubber** (sd, 10 min). Importance of planned conservation of rubber during the war. Sales story of differential dual wheels based on the problem of tire rationing, pointing out how these wheels increase tire mileage and "ration rubber." Although tire rationing is now an outdated problem, this strip provides a good example of "timely" salesmanship and advertising.

**Proof on Wheels** (sd, 18 min). Sales presentation for differential dual wheels used on Fruehauf trailers, indicating and demonstrating all selling points,



stressing the possibility of more profits through greater savings. Good example of how one feature of a product can be played up in the presentation.

**Cards on the Table** (sd, 25 min). Discussion of value of Fruehauf trailers to dealers, providing increased income for the dealer. Many aspects of the company's services to dealers; the wide market for trailers, features of the trailers; types available for many kinds of customer needs. An example of dealer-selling techniques. May also be useful in demonstrating to class the role of the dealer in modern sales.

**In the Van of Progress** (sd, 28 min). Two Fruehauf dealers on train, after visit to trailer factory, discuss need to give their prospects all the facts. Outline a four-point construction story and present the sales talk to each other. Good device for presenting method of planning a sales talk to utilize the product facts to best advantage.

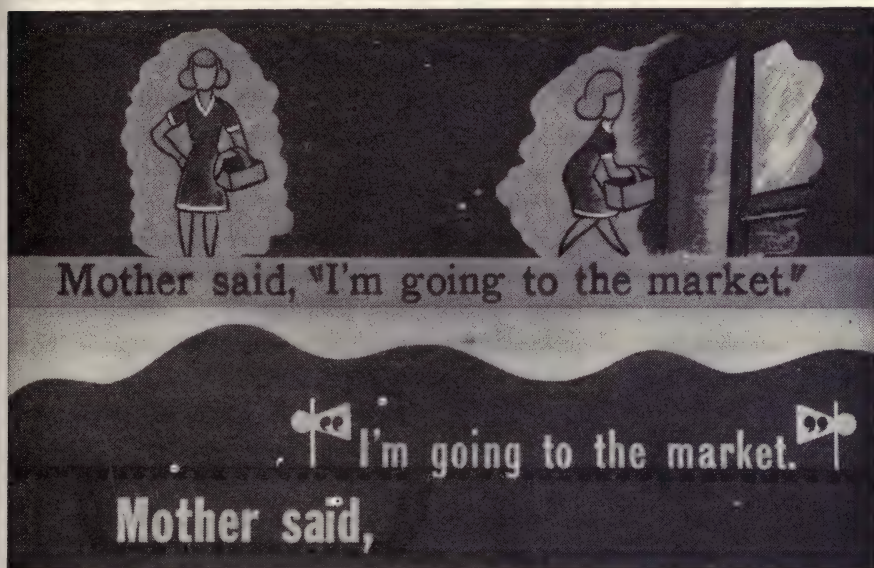
**They Speak for Themselves** (sd, 20 min). Sales presentation for Fruehauf tractor-trailers, indicating that these units "speak for themselves" in efficiency on the road. Discussion in detail of special features of trailer construction which provide for economy, efficiency, and bigger pay loads at less cost.

**From an Idea—an Industry** (sd, 10 min). History of the development of the tractor-trailer industry from a lumberman's request for a custom-built trailer in 1914. Includes sequence showing manufacturing processes, research, quality controls, and testing. Ends with photographs of various uses of trailer-tractor units indicating their values to product consumers. Suitable also for advertising classes and may interest elementary grade classes in economic geography or social studies.

**Follow the Leader** (sd, 20 min). Indicates Fruehauf as the "leader" in production of tank trailers for transportation of gasoline, milk, etc. Advantages and selling points in detail. Stresses importance of Fruehauf experience in the field and their ability to design special tanks for any purpose. Good material on presentation of sales points for specific selling problem.

# English

English composition is a subject in which diagraming was abandoned by many teachers some time ago. The investment of funds for the introduction of any other visual device in this field can be questioned. The two series produced this year provide material with which the individual teacher can form her own



From color filmstrip "Quotation Marks." (Popular Science Publishing Co.)

opinion as to whether this type of material is helpful. Many English instructors, like their colleagues in mathematics, will feel that the inherent difficulties of visualizing the problems in their field make the use of filmstrips unnecessary. Others may feel that the use of filmstrips like those described below is highly desirable in the lower grades to stimulate interest and as a means of motivation.

The cost of color prints may be prohibitive in some situations. Even though the color devices now used in the available filmstrips in this area might be referred to as functional, it can be hoped that black-and-white strips will be developed expressly to stimulate interest.

One of the great problems with many students is their inability to understand why they need to learn correct grammar, punctuation, and spelling. Perhaps



future filmstrip productions can provide logical reasons, acceptable to students, and present vividly the need for acquiring proper habits that will be used automatically in the many everyday situations requiring an ability to express thoughts in writing.

**All Aboard the Punctuation Express** (Popular Science, 6 films, si, color, teacher's guide). Direct teaching material on punctuation, using and explaining several examples of the proper placement of each type of mark. A number of visualization devices are used, the major one being a comparison of sentences, phrases, and clauses with railroad trains and tracks, with the punctuation marks as signals. Another device is the use of cartoon figures personifying the punctuation marks. Color emphasizes the placement of the marks and is utilized for emphasis of sentence "patterns" to provide a visual mental image that can be easily retained. Practice frames, followed by answer frames with reasons for the correct punctuation, accompany each major teaching sequence. Most of the strips also include text frames to be copied by students in notebooks. Summary sequences end each filmstrip. Some of the parts contain too much information for direct teaching in one class session, but are organized so that sequences dealing with one type of punctuation can be shown separately if required by class needs. If this is done, the entire strip provides an excellent review. The series is designed in treatment, examples, and visualization for upper elementary grades or junior high school. Individual titles with descriptions follow:

**The Comma** (Part I, 45 frames). Opens with story of comma left out of a tariff law and resultant loss of revenue. Definition of punctuation as way of conveying meaning of sentence. Use of commas in punctuation of series: plain series, addresses, and dates. Emphasis on using comma to cut addresses or dates from rest of sentence, and not using one to cut plain series from rest of sentence. Practice in using commas in phrase series and in series of pairs.

**The Comma** (Part II, 32 frames). Explanation of "loose" and "tight" parts of sentence; definition. Use of commas in "loose" parts of sentence. Indicates that sensing loose parts of sentences should become as automatic as writing "a" or breathing and walking. Loose parts of sentences compared with cars of a train, which are run off onto a siding. Sample sentences drawn on railroad tracks with loose parts punctuated and written on siding. Types of loose parts shown include "yes" and "no," adverbs such as "however," names of persons addressed, and words in apposition.

**The Comma** (Part III, 40 frames). Review of "loose" parts of sentences. Examples of other types of loose parts: clause following name of person, place, or thing. Indicates when such clauses are loose and when they are tight. Using commas to set off introductory phrases and clauses that are out of the normal

order. Commas in compound sentences having a conjunction. Setting off loose "ing" and "ed" phrases.

**Quotation Marks** (58 frames). Quotation marks as stop and go signs in written conversation, use in showing beginning and end of words of the speaker and sidetracking words not necessary to main line of conversation. Four patterns for writing conversation shown. Use of capital to begin quotation; punctuating end of quotation. The broken quotation. Other uses of quotation marks: titles, excerpts copied from writings of others (plagiarism explained), quoting paragraphs, quotation within a quotation.

**Apostrophe** (34 frames). Cartoon figure of apostrophe compares himself with comma in shape, indicates his uses, gives definition, and states his two jobs—to indicate ownership and to show omission of letters. Examples of both uses. Methods of forming possessive of singular and plural nouns. Examples of use in showing omission of letters. Use in showing possession in abbreviations, in proper nouns ending in "s," in two names such as those of two owners of one store.

**Colon, Semicolon, and Dash** (44 frames). Cartoon figures of each introduce themselves and state uses. Colon: a sign of introduction—used in letter heading, statements, long series, topic, and with figures. Semicolon: treatments for related sentences; use with conjunctive adverbs. Dash: emphasis on use only for special occasions, several examples given; visualized as a plank bridging a gap.

**English** (Curriculum, 10 filmstrips, si, color, teacher's guides). This series is divided into three subseries: Spelling (4 filmstrips). Grammar (3 filmstrips). Vocabulary (3 filmstrips). Necessarily, each strip contains considerable text and depends heavily upon the textual content. The spelling group utilizes cartoon figures to enliven the pictorial content, but most of the teaching material is to be found in the captions and text frames. The grammar series presents each topic through a story device, which, while interesting and stimulating to the imagination, depends heavily upon the dialogue of the cartoon figures. The vocabulary group also uses story devices with dialogue of great importance to the teaching value of the strips. In the spelling strips, the visual devices are suitable for elementary grades, while subject matter and treatment may be better suited to upper elementary or junior high school classes. The grammar strips are suitable in stories, treatment, and subject matter for the intermediate grades. The first and second vocabulary strips are of intermediate and upper elementary level, while the third uses a story device better suited to high school students. Each strip in the series contains too much information for presentation in one class session, in many situations, except for introduction or review. It may be desirable to present them



a sequence at a time for direct teaching purposes. Individual titles with descriptions follow:

**Spelling I—Some Problems** (No. E-1, 43 frames). Designed for motivation and to stress importance of correct spelling. Following problems presented and answered: Why is it spelled that way? Origins of words and examples of several. Are words spelled the way they sound? Examples of many that are spelled the way they sound; need to pronounce correctly in order to spell correctly. Do reading habits affect spelling? Effects of careless reading on spelling. Does spelling really matter? Importance of spelling in getting and keeping jobs, and its effect on opinion others form of the writer.

**Spelling II—Seeing-Hearing** (No. E-2, 56 frames). Points out errors in spelling caused by faulty pronunciation and methods of counteracting them. Opening sequence stresses seeing, hearing, and saying words correctly as aids to spelling. Cartoon figures of Snaffer, Take, Put, and Mix-Up to personify error types. Snaffer controlled by photographing words mentally; Take and Put corrected by correct pronunciation without taking away or putting in syllables or letters; Mix-Up corrected by hearing and saying words correctly and not reversing order of letters or syllables. Stresses need to look at words carefully, say them properly, and exaggerate the sounds.

**Spelling III—Memory Aids** (No. E-3, 53 frames). Designed to illustrate use of mnemonics as aid to remembering correct spelling. Imagination pictured as a light bulb that can aid memory. Examples of pictorial memory aids: dome for "capitol"; pie for "piece"; standing for "stationary" and paper for "stationery"; cemetery with "E" on all tombstones for aid in remembering "cemetery"; accident for "careless"—if you're careless you will be carless; mental picture of "aw-wa" for "awkward," etc.

**Spelling IV—Use of Dictionary** (No. E-4, 54 frames). Gnilleps Stibah, cartoon figure, suggests helps to student who has spelling difficulties. Review of things student should know: origins of words; need for careful reading and proper pronunciation; listening carefully; sounding carefully; use of memory aids. Need to know meaning, pronunciation, and how word changes. Word "separate" as example: pronunciation and spelling as found in dictionary; origin, meaning, and forms it takes; development of "pa" picture as memory aid. Student follows steps with word "generally."

**Grammar I—Subject and Predicate** (No. E-5, 53 frames). To indicate that every sentence has a subject and a predicate, the function of each and recognition of each in simple sentences. Presented in a story of Subject and Predicate appearing before judge in courtroom and each insisting that he is more important than the other. Judge shows them that they are wrong; sentences and

instances in a circus used for examples. "The circus has come to town"—sentences communicate thoughts to others. Subject and Predicate each juggle words while defining own functions, and do double juggling act to show that they make complete thought only when they work together. Review of what subject is and what predicate is. Basic elements of sentence shown as two parts of a clown horse, Subject in front of horse, Predicate in hindquarters of horse, together making a complete horse. Also shown in trapeze act and tight-rope act. Summary as cartoon figures leave court agreeing that they are both of equal importance.

**Grammar II—Modifiers** (Adjectives and Adverbs) (No. E-6, 49 frames). Adjective and Adverb presented as cartoon figures of employees of Grammar, Inc., a factory that manufactures the "world's best sentences." The two fight constantly because they envy each other's jobs. Employer tells them to exchange jobs and try to do each other's work. During experiment Adverb and Adjective define themselves and explain their functions, and also define noun, pronoun, verb. Examples of the proper and improper use of adjectives and of adverbs. Ends with figures returning to the factory content to do their own jobs.

**Grammar III—Nouns** (No. E-7, 52 frames). A. Noun personified as versatile actor applying for job at Colossal Studios. President of company refuses employment, but A. Noun proves his versatility in playing parts of people, things, ideas, etc., and also of plurals and of masculine and feminine forms. In proving his case, A. Noun impersonates old man, village of Tottenville, chair, happiness, two boys, lamps, etc. Includes explanation of formation of plurals by adding "s" and exceptions such as men, oxen, geese, deer, and foreign words. Defines feminine, masculine, and neuter gender, giving examples of each. Ending sequence: director calls cast for early morning rehearsal; A. Noun is only person who appears. In explaining this to director A. Noun reviews information given in strip.

**Vocabulary I—Communication** (No. E-8, 56 frames). Importance of language, how media of communication develop, functions of words, ways in which vocabularies grow shown through story of Pierre Marcel, French orphan age eleven, who is lost in New York upon his arrival in the United States. He meets Susie who teaches him enough English so that he can make clear the fact that he is lost. Includes information on learning words by hearing others use them, by using gestures to learn words, by associating words and objects, by reading, and from different kinds of jobs each of which has its own vocabulary, etc. Pierre and his uncle are reunited and Pierre reviews ways in which he learned English.



**Vocabulary II—Word Backgrounds** (No. E-9, 52 frames). Opens with view of room containing many familiar things; each object labeled with name. Roots of various words shown: story of origin of word "sandwich"; brief indications of origins of sofa, paper, library, book, alarm, bus, school, alphabet, cab, soup, and others. Stresses fact that origins of words can be found in dictionary. Indicates that some men have spent their lifetimes untangling word roots. Sample word stories well illustrated and may stimulate student search for word origins. No indication of how such knowledge can be of assistance to student.

**Vocabulary III—Development** (No. E-10, 48 frames). Joe, a likable high school student, loses respect of his girl Sally as he has a habit of misusing words and not making his meaning clear. He sets out to improve his vocabulary; he later meets Sally and wins back her respect by his knowledge of words and ability to use them properly. Includes a rival, Jackson, who uses words correctly and has good vocabulary. Processes followed by Joe in developing his vocabulary include study of dictionary, and four-step method of adding new words (1) finds a new word, (2) looks it up in dictionary, (3) puts word and definition in notebook, (4) uses word in conversation with friends and in school. Sources of new words: reading, motion pictures, radio, conversations.

# Fine Arts

The filmstrip material in this subject has been grouped as (1) The Visual Arts and (2) Music. As Helen Gardner said in her preface to "Art Through the Ages,"<sup>1</sup> the visual arts cannot be classified dogmatically since they are too closely interrelated "for example, a statue or relief may be so integral a part of a building that its form can be understood only as a part of the design of the building." Another reason for the visual arts classification is that the arts of one age or of one area often show in their development the influence of one upon the other, particularly during the early periods when one artist frequently worked in several media. Some of the filmstrip series in this group have taken this approach, while others are restricted to one art form.

Ironically enough this is one much neglected area although it has the greatest potentiality. One would think that the challenge of education would have attracted the great contemporary creative artists, as the challenge of religion stimulated some of the finest works of art in earlier times. To be sure, the requirements of art in the teaching of mundane classroom subjects has never been clearly expressed, even in the teaching of the fine arts themselves, but contemporary art of past centuries has been frequently used as a teaching aid in present-day classrooms. The writer knows of only one instance in which a first-rate contemporary artist, Jack Levine, has devoted himself to creative expression through the filmstrip medium. Some well-known cartoonists and commercial artists work in this field occasionally, but filmstrip assignments are frequently subordinated to creative efforts that reach a larger audience. It can only be hoped that the future mass production of nonmoving illustrative sequences will make it practical for the great creative talents of our times to give serious consideration to expressing themselves in a form suitable for reproduction by filmstrips in addition to the more conventional media.

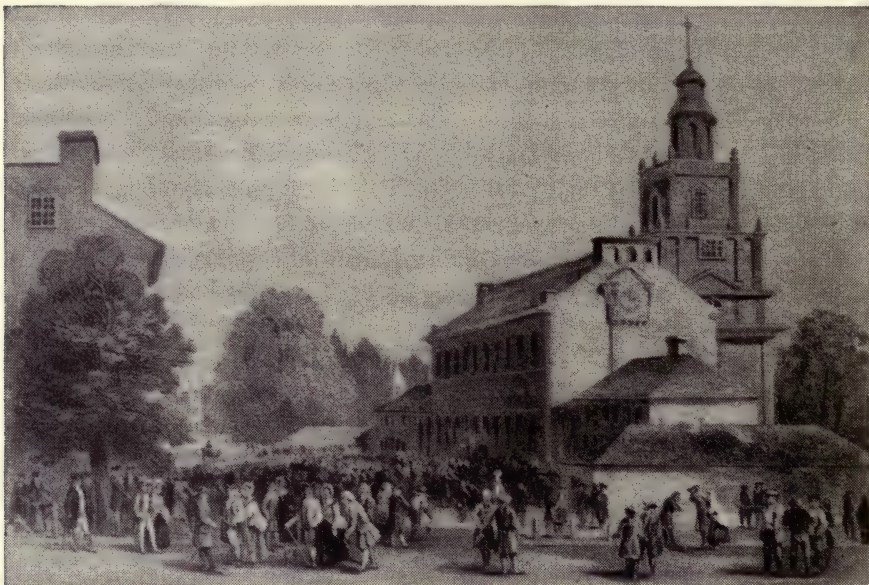
Even though there is a fairly large group of filmstrips available in the visual arts, the majority are related to the history of the arts with very little attempt to touch other aspects of the field. Possibilities for future production are many and could provide, among others, more of contemporary art, including industrial applications, examples, and elements of commercial art. The large slide collections

<sup>1</sup> GARDNER, HELEN, "Art through the Ages," Harcourt, Brace and Company, New York, 1936, p. 3.



of colleges, universities, and some museums could be distributed economically via filmstrips to those institutions unable to gather such large collections.

In history of art and art appreciation classes, it is especially desirable to have available a fund of illustrative material, since students cannot study the arts in the



Reproductions of paintings, prints, and other contemporary art can contribute effectively in other fields of study. Example from filmstrip "Declaration of Independence." (Stillfilm Co.)

abstract, but must see many examples. Filmstrips provide such material and may be used to

1. Present examples of various arts for illustration, discussion, analysis, and comparison.
2. Supplement available slide collections.
3. Augment museum or gallery visits, particularly in areas where art exhibits are difficult to reach.
4. Assist in showing the arts against a background of civilization in their relationship to social, political, and religious conditions.

Visualization of the auditory arts is difficult and very little has been done in the field of music. There are a few of the song-slide type, which may be of some interest for group singing, and one sound-slide series. It is in the sound filmstrip that the future of materials for music classes probably lies, for it is necessary to

hear music rather than to talk about it. One treatment might comprise recordings of musical selections, accompanied by a film showing appropriate scenes of the orchestra. Other pictorial material, to accompany recordings, might include landscapes for pastorales or drawings depicting the story of selections that are musical narratives, if the instructor wishes to present the class with tentative interpretive material. Of course, many prefer to present music as an auditory art without any visualization as an accompaniment. In such situations filmstrips can only be used to show instruments, orchestra diagrams, and projected scores for class discussion. The silent filmstrip may also have a future in biographies or in such subjects as the history and mechanics of instruments.

## THE VISUAL ARTS

**Art Series** (SVE, 8 films, si, 50 to 60 frames each, manuals). A series of reproductions, in black and white, of famous paintings of the period indicated in the individual titles. The paintings are not identified in the film, nor are the names of the artists indicated. This information is in the manuals only; therefore this series is not meaningful without data of the type supplied in the manuals. Individual titles are listed below.

### Development of Architecture in Europe

#### Italian Art, I to XVI Centuries

#### Italian Art, XIII Century to Early XVI

#### Italian Painting, High Renaissance—XVI Century Florentine, Umbrian, Venetian

#### Italian Sculpture, III to XVI Centuries

#### Italian Art, Michelangelo—1475–1564

#### Northern Painting—Flemish, Dutch

#### Painting, France and England—XVIII and XIX Centuries

**Artists of the Renaissance** (SVE, 2 films, si). Suitable for study of history of art in upper elementary or high school classes. Reproductions, in black and white, of famous paintings with information concerning artist, dates, and type of paintings. The text material appears either on separate frames or on the reproduction of the painting. In the latter case, the text detracts from the study of the painting and necessitates a smaller reproduction. Individual titles with descriptions appear below.

**Artists of the Renaissance (Italian) 1266–1576** (44 frames). Work of the following artists: di Bondone, Fra Angelico, da San Giovanni, Fra Filippo



Lippi, della Robbia, Mantegna, Botticelli, Il Ghirlandajo, da Vinci, Luini, Michelangelo, Raphael, del Sarto, Titian.

**Artists of the Renaissance 1366-1675** (German, Flemish, Dutch, Spanish) (49 frames). Work of the following artists: Dürer, Holbein, Van Eyck, Memling, Van Dyck, Rubens, Hals, Rembrandt, Vermeer, Velásquez. Some information on difference of Dutch paintings in character from that of other countries after the Reformation.

**The Development of Greek Vase Painting** (SVE, made by the University Museum, si, 54 frames). Discussion and examples of Greek vase paintings beginning with those of early Crete and bottle from Cyprus dating about 1400 B.C. Indicates development from naturalistic decoration to stylized and linear paintings, of grandly composed complete scenes, use of humorous figures, the "reserved" technique. Ends with bowl dating about 420 B.C. just before vase painting ceased to be an art. Suitable for students of art history and as supplementary material for archaeology classes. Vocabulary advanced. A great deal of text.

**History of Arts Series** (Filmette, 27 films, si). Reproductions and photographs of paintings, architectural types and details, ornaments, buildings, sculpture, metalwork, pottery, etc., of each period, indicating development of art of each period or place. Each item is identified, dates are given, and artists' names provided where known. Captions are in German, French, and English. The material is arranged in chronological order, beginning with the earliest artifacts of each period. Buildings and other structures are shown by photographs of existing remains, sketches, models, or reproductions. Excellent illustrative material for art history classes and may also interest ancient or medieval history classes as supplementary material. Individual titles are listed below.

**Egypt** (Sculpture and Plastic I) (No. 186, 83 frames).

**Egypt** (Sculpture and Plastic II) (No. 187, 68 frames).

**Egypt** (Burial Methods, Worship, Tutankhamen) (No. 188, 95 frames).

**Babylonia, Assyria, and Persia** (No. 189, 72 frames).

**Pre-Hellenic Art** (No. 190, 82 frames).

**Greek Architecture** (No. 191, 117 frames).

**Important Greek Sculptures** (No. 192, 63 frames).

**Athens** (No. 193, 85 frames).

**Ancient Greek Towns and Landscapes** (No. 194, 79 frames).

**The Ancient Theater** (No. 195, 75 frames).

**Ancient Rome** (No. 196, 127 frames).

**Roman Emperors** (No. 197, 42 frames).

**Pompeii** (No. 198, 79 frames).

**Bronzes from Pompeii** (No. 199, 38 frames).

**Ancient Roman Residences** (No. 200, 45 frames).

**Ancient Greek and Roman Portraits** (No. 201, 65 frames).

**Ancient Roman Funerals and Tombs** (No. 202, 51 frames).

**German Architecture** (Carolingian Epoch to Late Gothic) (No. 203, 100 frames).

**Roman to Gothic Architecture** (No. 204, 42 frames).

**Gothic Brick Architecture** (No. 205, 78 frames).

**German Plastic Art** (Thirteenth Century) (No. 206, 87 frames).

**Italian Architecture** (Roman Epoch to High Renaissance) (No. 207, 102 frames).

**Italian Plastic Art** (Thirteenth to Fifteenth Century) (No. 208, 99 frames).

**French Architecture** (Archaic-Christian, Archaic-Primitive, Roman) (No. 209, 80 frames).

**Medieval Spanish Architecture** (No. 210, 67 frames).

**English Cathedrals** (North) (No. 211, 58 frames).

**English Cathedrals** (South) (No. 212, 69 frames).

**Indian Art** (SVE, 2 filmstrips, si, about 32 frames each, manuals). Uncaptioned photographs are offered in these two filmstrips, making it necessary to accompany their use with information of the type supplied in the manuals. The subject material is suitable for elementary classes studying Indian art. Individual titles with descriptions follow.

**Navajo Silversmiths** (32 frames). Examples of Navajo silversmith's work; methods of work in producing silver ornaments and objects; Navajos wearing silver ornaments.

**Pueblo Pottery** (31 frames). Methods of making pottery from gathering of clay and preparing of materials to completed product. Shows several types of pottery.

**Indian Pottery Making** (Stillfilm, si, 30 frames). Steps in the making of Pueblo pottery: mixing clay, sand, and water; kneading; forming a bowl, application of red-clay slip; decorating methods; materials used; firing; sun or oven drying. Good factual survey suitable for elementary grades or junior high school. May also interest hobby groups.

**Landseer, Painter of Dogs and Deer** (SVE, si, 36 frames). Text frames provide information on birthplace and date, family talents, and some biographical data pertaining to Landseer's paintings. Reproductions of a number of paintings including the early ones and those done in Scotland. Emphasizes eminence as painter of dogs, showing human sentiments, understanding, and love of animals. May interest upper elementary and junior high school art classes as supplementary material.



**Masterpieces of Painting** (McClure, 2 parts, sd, 40 min each, color). These two filmstrips utilize an approach which differs from others in this field in that they are designed for general adult and club use rather than for direct teaching in schools. The films consist of full-color reproductions of famous paintings, either the entire canvas or details. Part I presents paintings in the permanent collection of the Art Institute of Chicago; Part II, paintings in the permanent collection of the National Gallery of Art. Both open with some data concerning the gallery, types of exhibits, and, in the case of Part II, donors. The accompanying recorded lecture gives information concerning the artist and characteristics of his work, with some general remarks about the painting itself. The comments are general in nature and are not designed to present detailed study of either artist or painting. While the presentation is interesting material for clubs and similar groups, each part presents too many paintings for specific teaching use in art or art appreciation classes although some classes at the higher levels may find them of interest as supplementary, introductory, or review materials. Paintings included in each of the two parts are indicated below:

**Part I (40 frames).**

- Cézanne—"Basket of Apples"
- Carlsen—"The Miraculous Draught"
- Degas—"The Millinery Shop"
- Delacroix—"Combat of the Giaour and the Pasha"
- Derain—"Stag Hunt"
- El Greco—"Assumption of the Virgin"
- Greuze—"Little Girl Pouting"
- Hals—"Portrait of an Artist"
- Henri—"Himself" and "Herself"
- Higgins—"Spring Rain"
- Hobbema—"Watermill with the Great Red Roof"
- Homer—"The Herring Net"
- Inness—"Sunset in the Valley" and "In the Valley"
- Kandinsky—"Improvisation No. 30"
- Lee—"Thanksgiving Dinner"
- Marc—"The Bewitched Mill"
- Memling—"Madonna and Child"
- Millet—"Bringing Home the Newborn Calf"
- Monet—"Beach at Sainte Adresse" and "Westminster, London"
- Pietro—"Madonna, Saints Jerome and Bernardine"
- Rembrandt—"Girl at an Open Half Door"
- Renoir—"On the Terrace"

Sargent—"The Honorable Mrs. Swinton" and "Mrs. Dyer"

Savage—"George Washington in 1790"

Sorolla—"The Two Sisters"

Stuart—"Major General Henry Dearborn"

Sully—"Mrs. George Lingen"

Ter Borch—"The Music Lesson"

Titian—"Education of Cupid"

Toscano—"Madonna"

Turner—"Dutch Fishing Boats"

Ufer—"The Solemn Pledge"

Van Gogh—"Sunny Midi"

Wood—"American Gothic"

Zurbaran—"Saint Romanus, Martyr"

## Part II (48 frames).

Bellini—"Madonna and Child in a Landscape"

Botticelli—"The Adoration of the Magi"

Cassatt—"Boating Party"

Cimabue—"Christ Between Saint Petro and Saint James Major"

Copley—"The Copley Family"

de Landi—"The Battle of Actium"

Dossi—"Scene from a Legend"

El Greco—"Saint Martin and the Beggar" and "The Virgin with Santa Ines and Santa Tecla"

Gaddi—"Madonna and Child with Saints and Angels"

Giorgione—"The Adoration of the Shepherds"

Hals—"Portrait of an Officer" and "Young Man in a Large Hat"

Hobbema—"The View on a High Road"

Lancret—"La Camargo Dancing"

Lawrence—"Lady Templeton and Her Son"

Lotto—"Allegory"

Maes—"An Old Woman Dozing Over a Book"

Manet—"The Old Musician"

Monet—"Rouen Cathedral"

Moroni—"A Gentleman in Adoration before the Madonna"

Panini—"The Interior of the Pantheon"

Peale—"George Washington"

Perugino—"Madonna and Child"

Raeburn—"The Binning Children"

Raphael—"The Alba Madonna"



Rembrandt—"A Polish Nobleman," "Self Portrait," "The Philosopher," and "The Mill"

Ricci—"The Last Supper"

Savage—"The Washington Family"

Stuart—"Andrew Jackson"

Tintoretto—"The Worship of the Golden Calf"

Titian—"Andrea dei Franceschi"

Turner—"Approach to Venice"

Van Dyck—"Susanna Fourment and Her Daughter," "William II of Nassau and Orange," and "Lady D'Aubigny"

Velázquez—"Portrait of a Young Man"

West—"The Red Cross Knight"

**Museum Art Series** (SVE, made by University Museum, 10 films, si). Examples and discussion of art development of the peoples indicated in the individual titles. Pictorial material consists of photographs of various artifacts, existing structures, and reproductions. The text material is long with advanced vocabulary. The series is suitable for high school or college classes in the history of art or archaeology. Individual strips described below.

**African Sculpture** (63 frames). Development of African arts; influence of foreign elements; importance of religious influence; uses of wood carvings; ceremonial fetishes. Examples include Benin bronze castings; wooden images and masks from various areas and tribes including those of the Congo.

**The Art and Civilization of the Maya** (61 frames). Text describes the great cities of the Old Empire, of the New Empire in Yucatan, clothing, agriculture as basis of life, methods of stone construction, work in astronomy, and religious ceremonies. Examples of art shown include temples, vase pictures, weapons, city plans, stone carvings; minor arts such as pottery, terra-cotta figurines, marble cups, ornaments, and books. Some views of the modern Mayans.

**Arts and Crafts of the American Indians** (63 frames). Text describes importance of arts and crafts to daily life of American Indian and discusses the examples shown. Examples include pottery, canoes, implements, house decorations, pipes, stone carving, basketry, weaving, etc. Tribes included are those of Northwest coast, Southeastern, Southwestern, and the Mound Builders.

**Arts and Crafts of Negro Africa** (60 frames). Text indicates areas occupied by various groups and relates art objects to daily life of the people. Examples include wood carvings, implements and utensils, textiles, pottery, ivory objects, mats, basketry, musical instruments, iron knives and spears, scarifying as an art.

**Arts and Crafts of the Pennsylvania Germans** (48 frames). Text indicates how German immigrants brought their arts and crafts with them and devel-

oped them in isolated communities here. Examples of various arts and discussion of each: home interiors and exteriors; ironware, glassware, slip-decorated pottery, handwoven textiles; Stiegel and his glasswork discussed.

**Art in the South Seas** (80 frames). Types of peoples in South Sea Islands and maps showing where each is located. Text describes characteristics, uses, and development of arts. Examples include Papua—houses, figures, religious masks, memorial panels. New Caledonia—masks, implements, weapons. Melanesia—masks, memorial panels. Fiji—wood carving, pottery. Polynesia—wood carvings, war canoes, tattooing, ornaments, textiles, clubs, amulets. Easter Island—stone figures. Micronesian ornaments and mats.

**Chinese Buddhist Art** (53 frames). Text and maps indicate the development and spread of Buddhism. The following examples of art given with discussion of characteristics: sculpture of A.D. 150, temples along pilgrim's routes; Caves of Thousand Buddhas at Tun Huang; Yun Kang cave temple carvings and images; Lun Men temples; sixth-century realistic figurines, paintings, and ornaments; vitality of art fading by end of ninth century.

**Development of Greek Sculpture** (57 frames). Text discusses development, characteristics, and improvements of sculpture examples, which include rigid statues of period about 650 B.C.; those of 550 B.C.; relief panels and friezes before 500 B.C.; carvings and sculpture of 480 B.C., period of the Parthenon at zenith of Greek sculpture; work of Myron, Polycleetus, and Praxiteles.

**Egyptian Art** (59 frames). Text discusses characteristics of art shown and its relation to civilization and manner of life. Includes art of the fourth millennium B.C., development during the Old Kingdom, the Middle Kingdom, and the Empire. Includes artifacts from tomb of Tutankhamen.

**Value of Chinese Painting in Art Instruction** (65 frames). Discussion of Chinese and Japanese painting to be used by art instructors to illustrate basic elements of art used in a simple way. The following is discussed and examples given: use of line, light and shade, and color; rhythmic vitality, dramatic power from few simple lines, repetition of line and rhythm to express speed; composition, lightness, and grace; methods of expressing various emotions; impressionistic work, realism; elimination of everything except those features which contribute directly to the main feeling.

**Oberammergau and the Passion Plays** (Filmette, No. 272, si, 56 frames, Part I, black and white, Part II, hand colored, guide). Part I shows various scenes in and around Oberammergau and close-ups of peasant actors in the passion play. Part II consists of scenes from the play. Although somewhat long, this strip may be of interest in dramatics classes, in history of the drama, and as supplementary material in history classes.



**Painting Series** (Filmette, 19 films, si). Reproductions of paintings by famous artists of the period indicated. Each painting and artist is identified, and dates are given; in many cases the location of the painting (as prior to the Second World War) is also indicated. In the few strips dealing with one artist, biographical material is also included in addition to reproduction of many of the artist's paintings, drawings, and sketches. The brief captions appear in German, French, and English. Excellent illustrative material for art history or appreciation classes in senior high school or college. Individual titles are listed below.

**German Painting** (3 filmstrips).

XVth and XVIth Century (No. 213, 107 frames). Lochner, Pacher, Dürer, Cranach, Grünewald, Baldung-Grünen, Holbein, etc.

XVIIIth and XIXth Century (No. 214, 97 frames). Chodowiecki, Graff, Rethel, Schwind, Richter, Feuerbach, von Marées, etc.

XIXth and XXth Century (No. 215, 85 frames). Menzel, Böcklin, Thoma, Leibl, Liebermann, etc.

Dürer (No. 216, 76 frames).

Michael Pacher (No. 217, 87 frames). Painting and Plastic.

Bohemian School (No. 218, 88 frames). Paintings.

**Italian Painting** (3 filmstrips).

Early Renaissance (No. 219, 66 frames).

Leonardo da Vinci and Michelangelo (No. 220, 70 frames).

Raphael (No. 221, 91 frames).

**Dutch Painting: Rubens and Rembrandt** (No. 222, 79 frames).

**French Painting** (3 filmstrips).

Beauneveu, Poussin, Lebrun, Clouet, etc. (No. 223, 55 frames).

Watteau, Pater, Boucher, Chardin, etc. (No. 224, 63 frames).

David, Millet, Rousseau, Courbet, Manet, Moreau, etc. (No. 225, 67 frames).

**English Painting** (Reynolds, Gainsborough, Romney, etc.) (No. 226, 59 frames).

**Spanish Painting** (Velásquez, Murillo, Goya, etc.) (No. 227, 51 frames).

**Constantin Meunier** (Painting and Plastic) (No. 228, 54 frames).

**Applied Arts** (3 filmstrips).

Smith's Art Work (No. 229, 59 frames).

**Furniture Styles** (Antiques up to Mediaeval Epoch) (No. 230, 105 frames).

**Furniture Styles** (Renaissance, Baroque, Rococo, Empire, Biedermeier) (No. 231, 102 frames).

**Rosa Bonheur, the Greatest Woman Painter** (SVE, si, 31 frames). Text provides some biographical data pertaining to the development of Bonheur's paintings and indicating early talents, exhibitions, honors, study, work in Scotland, and in the Forest of Fontainebleau. A number of reproductions of her paintings—presented in chronological order. The emphasis is on her paintings as "a hymn to labor." Tends to eulogize the artist as a person as well as an artist. May interest some art classes as supplementary material.

See also the section on Archaeology and Anthropology and the following series and individual titles for supplementary, illustrative, or related materials:

Historic Rural Homes

Homemaking in Colonial Days

Rural Colonial and Early American Homes and Gardens

Ancient Egypt

European Background Series

Old London

Famous Cathedrals of Europe

European History Series

The German Town

Monastic Life and Ecclesiastical Art

Characteristic Landscape Views (The individual filmstrips concerned with various European cities.)

Monuments of Ancient Greece (Greece Series)

Water Pictures

Bridges, History and Types

Optical Illusions

Arabian Nights

Gulliver's Travels

Latin Series (Photographs of Roman architecture and art)

Geometry in Art

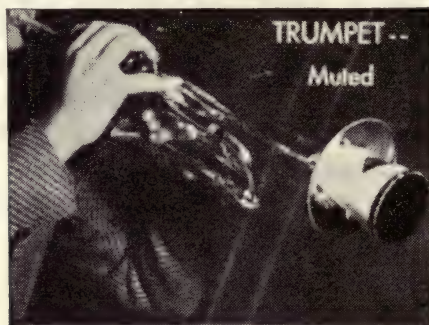
## MUSIC

**Carmen** (SVE, si, 20 frames). Text frames give synopsis of each act of this opera by Georges Bizet. Pictorial material consists of reproductions of paintings by Joseph Boggs Beale illustrating various scenes in each act. Includes following scenes: Carmen with Don José; Carmen escaping the soldiers; the Toreador's song; Carmen dancing for Don José; Carmen seeing death in the cards; the



rivals quarrel; José leaving Carmen; lovers at the arena; death of Carmen. May interest music appreciation classes as supplementary material.

**Instruments of the Orchestra Series** (SVE, 4 films, sd, about 10 min each). Each filmstrip in this series contains a few frames showing the instruments discussed; the recording gives a description of each instrument, examples of its sound, and an identification test. The last half of the recordings are to be played without using the filmstrip. The musical examples are played by high school students. While the pictorial material is of some interest, it could be



From filmstrip "The Brass," Part 3 of "Instruments of the Orchestra" series, produced by the Visual Education Section, Los Angeles City Schools. (*Society for Visual Education.*)

supplemented by real instruments in the classroom if these are available. Descriptions of the individual strips follow.

**The Strings** (Part I, 15 frames). Violin played with bow, played pizzicato and muted; viola, cello, bass.

**The Woodwinds** (Part II, 15 frames). Flute, piccolo, oboe, English horn, clarinet, bass clarinet, bassoon.

**The Brass** (Part III, 10 frames). A symphony orchestra, trumpet, muted trumpet, trombone, French horn, tuba—each held in playing position. Recording includes a brass quartet selection to show blending of tone.

**The Percussion** (Part IV, 10 frames). Kettledrums, bass drum, snare drum, gong, cymbals, orchestra bells, triangle, castanets. Recording ends with full orchestra playing selection from Dvořák's "Fifth Symphony," narrator pointing out that the various instruments and groups can be identified by sound.

**Patriotic Song Series** (SVE, 4 films, si, about 15 frames each, manuals). Each filmstrip presents the words of the song indicated by the individual titles, two lines at a time. Each two lines are illustrated with a photograph or reproduction of a drawing or painting. These strips may be of interest for group singing,

particularly in elementary classes which are learning the words of these songs. Titles follow.

**America**

**America the Beautiful**

**Columbia the Gem of the Ocean**

**The Star Spangled Banner**

**Song Series** (SVE, 4 films, si), Filmstrips present the words of 30 songs, which were selected by the National Music Week Committee. Each strip contains the words of several songs, giving stanzas and choruses on separate frames. The songs within each strip are divided by blank frames. This series may be of use in group singing especially where songbooks are not available. Individual titles with description of contents follow.

**Believe Me if All Those Endearing Young Charms** (43 frames). Also the following: "In the Gloaming," "Juanita," "Last Rose of Summer," "Long Long Ago," "Love's Old Sweet Song," "Stars of the Summer Night," "Sweet Genevieve."

**A Merry Life** (37 frames). Also the following: "A Warrior Bold," "Sailing," "Soldier's Chorus," "Loch Lomond," "Old Dog Tray," "Over the Summer Sea," "Sweet and Low."

**America** (40 frames). Also the following: "Columbia the Gem of the Ocean," "Keller's American Hymn," "Star Spangled Banner," "Tramp! Tramp! Tramp!" "When Johnny Comes Marching Home," "Yankee Doodle," "Anvil Chorus."

**Carry Me Back to Old Virginia** (54 frames). Also the following: "My Bonnie," "My Old Kentucky Home," "Old Folks at Home," "Swing Low Sweet Chariot," "Nancy Lee," "Annie Laurie," "Boola-Boola."

**The Story of the Star Spangled Banner** (SVE, si, 34 frames). Reproductions by paintings by Joseph Boggs Beale and text frames tell the story of how Francis Scott Key wrote the words of this song. Includes also portraits of Francis Scott Key, of John Stafford Smith, and of Joseph Boggs Beale. The second sequence presents the words of the song, two lines at a time illustrated with Beale paintings, for the class to recite. The last sequence contains both words and music with small reproductions of the paintings. The opening sequence contains good supplementary material for elementary history classes also. The recitation sequence is legible, but the last sequence is difficult to read since each frame contains music, words, and an illustration.



# Foremanship and Personnel Supervision

Only a few filmstrips have been produced for this area, and most of these were designed for use in industry rather than in school situations. The information presented, therefore, is concerned chiefly with actual personnel problems and application of theory in handling such problems. This provides the student with a useful substitute for observation or actual practice. Unfortunately, while the information is of a helpful nature, the treatment tends to be static pictorially and often lengthened by extraneous story devices.

It will be noticed that all the strips now available in this field for school use are accompanied by recordings. Sound can be very helpful in this subject, since proper handling of personnel problems involves the correct use of words and of the voice—what is said and how it is said has a direct bearing on successful handling. Also, the available materials deal mainly with foremanship activities, although the principles outlined or demonstrated are applicable to the handling of other personnel.

There is opportunity for considerable new production in this field to present other phases of foremanship and to provide materials for other personnel supervision. A good example of a positive approach to this field is found in the series produced for the Army Education Program which has not yet been released to the public.

The major contributions of existing and possible future filmstrips to foremanship and personnel supervision classes include the following:

1. To demonstrate applications of principles of personnel management and foremanship.
2. To present reenactments of methods of handling actual situations.
3. To illustrate how problems arise and how they may be recognized before they become serious problems.

**Double Horseshoes** (Dartnell, sd, 15 min, guide). Designed to make employees "courtesy conscious" and to promote better customer-employee relations. The story of a young man, returned veteran, employed in railway freight office, who is taught the principles of friendly service by Irene and Sally. Principles include cooperation—do more for people than they expect and approach problems from their point of view and consideration—friendliness, being a good listener, doing

something about customer's problems. At end of demonstrations of these two principles the young man wins a promotion, marries Sally, and leaves town for his new job. Excellent information for all types of employees who have contact directly with customers. Suitable for sales training and personnel management; may interest psychology classes also. Story device lengthens film and adds little to teaching value. Pictorial material often static.

**Personnel Supervision** (Photo & Sound Prod., 3 films, sd). Three different aspects of the personnel supervision problem, suitable for classes in personnel management or foremanship training. The subject matter is good, but the pictorial material tends to be static, showing groups talking rather than illustrating principles discussed. Individual titles with brief descriptions follow.

**Reprimanding Effectively** (20 min). Proper methods of reprimanding. Opens with poorly handled reprimand during which foreman loses his temper and worker requests transfer. Foreman worried about personnel problems talks it over with wife and daughter, and later with daughter's employer. Following rules formulated, each illustrated: Cool down and stay that way; make certain he deserves it; talk to him in private; be firm but explain why; show confidence in him. Ends with demonstration of proper reprimand following above rules, indicating results.

**Handling Grievances** (15 min). Proper method of handling complaints or grievances. Opens with example of foreman who handles a transfer grievance poorly and as result loses four men, and is reprimanded by his own supervisor for delay in an important shipment. Discusses problem with personnel manager and following rules are formulated: Show interest in the problem; get the whole story; decide on a course of action; act on the decision; sell him the decision if necessary. Ends with foreman handling another grievance properly.

**Inducting the New Worker** (15 min). Opens with demonstration of very poor induction of new worker which leaves the new man insufficient work, no knowledge of duties, unfamiliar with surroundings, and almost ready to quit. Foreman discusses problem with other foreman while on fishing trip. Rules for induction are formulated and ending sequence shows them applied in a reinduction of dissatisfied new worker in opening sequence.

**Supervisory and Foreman Conference Topics** (Jam Handy, 5 films, sd, about 15 min each, manual). Designed for the Carnegie-Illinois Steel Corporation for use in their foremanship training. However, the fundamental principles presented are applicable to all foremanship training courses. The pictorial material in some frames tends to be static, showing groups sitting or standing and talking. Individual titles with brief descriptions follow.



**Preparing for the Future** (No. 1, 15 min, 65 frames). Importance of developing qualified understudies to put foreman or supervisor in line for promotion. Suggestions for selection of understudies and for their development and training. Methods of training include developmental assignments; "send-him-upstairs" method (allowing understudy to handle problems with other foremen and to hold meetings); "get-the-facts" method; "man-management" method.

**Safety for Sale** (No. 2, 15 min, 74 frames). Responsibility for and importance of a continued safety program. Suggests methods of conducting such a program.

**Fair and Cool** (No. 3, 15 min, 67 frames). Supervisor's or foreman's responsibility for and obligations to his men. Suggestions for handling men tactfully, making men feel good about their jobs, developing proper attitude among workers, showing an interest in every man and his work. Stresses avoiding arguments, being fair, and keeping the temper controlled.

**Big Little Things** (No. 4, 15 min, 78 frames). General principles of handling ideas, suggestions, complaints, and grievances. Stresses importance of satisfying the worker and doing something about his opinions. Indicates that little things may pile up into large grievances and should be handled properly before they grow.

**New Men at Home** (No. 5, 15 min, 72 frames). Opens with sequence on loneliness in strange city and effect of meeting a friend there. Foreman's or supervisor's obligations to new employee, with suggestions on how to make him feel at home on the job and take pride in his work. Demonstration of proper induction and its results.

See also the section on Industrial Safety and the following individual titles for supplementary, illustrative, or related materials:

Eyes on the Job

Oh Say Can You See

Healthy, Wealthy, and Wise

Dale Carnegie Series

Merchandise Training Series

What It Takes

Fire Is Your Responsibility

Sales Training Series

How to Supervise Salesmen

Fire

Use of Fire Extinguishers

# Home Economics

Much of the material listed in this section was designed for use with rural groups, such as farm women and the 4-H clubs; however, it may be adaptable for school use, particularly in high schools that draw students from agricultural areas. Very little has been produced for more advanced students or for domestic science courses, although this field offers some highly pictorial subject matter. For example, the study of fabrics, of fashion or textile design, and of interior decoration are subjects that would be handled in the filmstrip medium advantageously. The high school courses in home economics also offer a number of areas for future production.

The few filmstrips now available in this field can contribute in

1. Demonstrating techniques and procedures (as in cooking or in sewing) to large groups prior to or after actual practice.
2. Illustrating details otherwise difficult to see, such as fabric weaves.

**Fibers, Threads, and Textile Fabrics** (Filmette, No. 17, si, 110 frames). Microphotographs of various types of fibers, threads, and fabrics: linen, flax, cotton, and silk fibers and threads; damask, satin, cheviot, serge, mohair, crepe, twill, tribot, piqué, toweling, velvet, gauze, brocade, tulle, lace, taffeta moiré, and artificial silk weaves. Identifying captions in German, French, and English. Excellent illustrative material for study of fabrics in home economics or domestic science courses in senior high school or college.

**Food Preservation Series** (Castle, made by USOE, 2 films, si, manuals). Designed for use with motion pictures of the same titles, but may be used separately for review purposes or as discussion guides. Photographs with question or review captions. Prepared specifically for farmwork instruction, but applicable in subject matter to school classes also. Titles with brief descriptions follow.

**Canning Beef** (No. OE 455). Questions and reviews of the following: preparation of soup stock; preheating beef for canning; packing in cans; using exhaust box; maintaining proper temperature in filled cans; sealing; processing; cooling and drying before packing.

**Community Canning** (No. OE 198). Questions and review of the following: picking snap beans; preparing for canning; inspecting and preparing cans; packing and exhausting cans; labeling and sealing; using pressure cooker; cooling, drying, and storing cans.



**Home Economics Group** (USDA, 12 strips, si, lecture notes). Prepared specifically for rural educational purposes, but applicable to classes in either high school or college. Individual titles with descriptions follow:

**Canning Chicken** (No. 658, 45 frames). Step-by-step demonstration of poultry canning with a quick and simple method of cutting up the bird.

**Canning Fruits and Tomatoes** (No. 660, 49 frames, double frame only). Introductory frames show equipment needed. Part I provides a step-by-step demonstration of canning peaches. Part II demonstrates tomato canning.

**Canning Meat** (No. 659, 40 frames). Step-by-step demonstration of meat-canning process.

**Canning Vegetables the Steam Pressure Way** (No. 661, 32 frames, double frame only). Step-by-step demonstration of steam-pressure canning of snap beans. Leaflet AWI-93 "Home Canning of Fruits and Vegetables" available—gives timetables and other printed directions for ready reference.

**Cooking Meat According to the Cut** (No. 314, 51 frames). Methods for cooking different cuts of meat to retain food value and bring out the flavor.

**Cooking Poultry, Older Birds** (No. 561, 38 frames). Steps in braising, casseroling, steaming, and stewing older birds. Suggestions for typical dishes.

**Cooking Poultry, Young Birds** (No. 560, 51 frames). Steps in broiling, pan-frying, French frying, roasting chickens. Suggestions on how to cook other young birds.

**Poster Slides** (No. 625, 38 frames, double frame only). Four sets of posters on (1) buying boys' suits, (2) buying bath towels, (3) slip covers, and (4) new cotton hosiery. Designed to assist homemaker in conserving money and materials.

**Simple Way to Iron a Shirt** (No. 649, 44 frames). Demonstration of quick, simple method of ironing men's shirts, which requires less time than usual methods. Also proper washing method, convenient ironing equipment, and proper folding of shirts to conserve drawer space.

**Slip Covers for Straight Chairs** (No. 592, 64 frames). Details on measuring for amount of material needed, choosing the fabric, and cutting, fitting, and finishing.

**Slip Covers for Upholstered Chairs** (No. 591, 65 frames). Step-by-step procedure: measuring two types of chairs for amount of material needed; selecting fabrics; cutting, fitting, trimming, finishing; making and using patterns.

**Step by Step in Everyday Tasks** (No. 643, 60 frames). Suggests short and easy methods of doing everyday tasks, stressing need to eliminate

unnecessary motions and steps. Points out that good homemaking manager works quickly and easily, gets the job done, and has time left for other things.

**How to Cook Eggs** (SVE, Poultry and Egg Nat'l Board, si, 51 frames, color, manual, loan). Opens with statement of healthful qualities of eggs as food, parts of egg, varying sizes, color of yolk, and grades of eggs. Indicates proper method of keeping eggs. Proper procedures in cooking eggs shown in detail: soft-boiled, hard-cooked; fried, broiled, poached, Shirred, scrambled, French omelet. Stresses importance of cooking slowly, using moderate heat. Ends with photographs of assorted egg dishes. Directions for cooking clear and precise. Can be shown either in entirety or in sequences as desired by class needs.

**How to Cook Meat by Dry Heat** (SVE, Nat'l Livestock and Meat Board, si, 52 frames, color, manual, loan). Detailed explanations of proper procedures in cooking meat by dry heat—roasting, broiling, and pan-broiling. Step-by-step directions include preparation of meat, type of pan, use of meat thermometer, proper temperatures and cooking time. Stresses importance of cooking slowly with low temperatures. Compares properly and improperly cooked meats. Directions for cooking clear and precise. Can be shown in entirety or in separate sequences.

**Proper Care Means Longer Wear** (Westinghouse, sd, 15 min, supplementary booklet, loan). Demonstrations of care and home repair of electric household appliances, opening with sequence on values of electric appliances and importance of their maintenance. Indicates improper usage practices. Detailed instruction on changing fuses, repairing worn cord, changing a plug, checking common causes of trouble before calling repair man; equipment needed for proper care and simple repairs. Rules for proper care listed. In spite of reference to wartime needs, contains excellent material for classes in home economics and electrical shopwork. May also interest general science classes.

See also the following series and individual titles for supplementary, illustrative, or related materials:

Textiles and Clothing Group

Inspection of Food Products

Nutrition

Our Health Is in Your Hands

See for Yourself

Furniture Styles

Knack of Easy Wrapping

Tommy Fork and His Fountaineers



Basketry

Finding Minutes

Meat Cutting Series

Rug Making

Making American Cheese

Making Butter

Trichinosis

Consumer Problems in Nutrition

**NOTE:** For child care classes see the sections on Physiology and Hygiene, and Diseases.

# Languages

Only two languages, Spanish and Latin, have received filmstrip treatment. In these, the approach for one is illustration of environment, history, and mode of life; and for the other, a specific attempt at teaching a language through pictures.

It may be desirable for students of a language to learn something of the peoples who speak that language, and as supplementary material, such illustrative films may find some uses, especially in Latin classes for which this type of material is now available.

Pictorial material can assist in building vocabularies through association of words with objects or situations.

However, the silent strip cannot be of as much assistance as the sound strip, particularly in development of speaking facility. Possible future productions utilizing pictorial material, text, and an accompanying recording may be of

real assistance to the instructor. Such language materials could (1) present the sound of the language and correct pronunciations, (2) provide for group participation in pronunciation (usually done with an appropriate pause on the record, allowing for class repetition of the previously

pronounced phrases), (3) present text material for practice reading after the recording has been heard, and (4) visualize the idiom, phrases, and new words, thus providing a memory association for the student. Such materials should be closely keyed to texts and courses in use so that the vocabularies presented could supplement the instructor's work properly. Experiments in Army and Navy language instruction have pointed the way to use of the filmstrip in this area. **Introduction to Spanish** (SVE, 10 filmstrips, si). Organized in 10 units in beginning Spanish, presenting the language in story situations. Designed for active class participation, the captions are to be read by the students. The first four units deal with words, phrases, idiom, and constructions. The other strips provide story material and songs to be read and sung by the class. The pictorial frames consist of drawings illustrating the words, phrases, or sentences used as captions. The opening frames in some strips offer suggestions as to the method of determining meanings of Spanish sentences or words. Individual titles with descriptions follow.



From filmstrip "Marzo y el pastor," Unit VI of Introduction to Spanish. (Society for Visual Education.)



**How to Understand Complete Thoughts** (Unit I, 26 frames). Indicates similarity to English words. Major part of strip consists of pictures with brief Spanish sentences to be read by method suggested in opening frame. The ending frames present interrogatives and Spanish questions for the class to answer in Spanish.

**How to Discover the Meanings of New Words** (Unit II, 28 frames). Methods suggested: relationship to words and phrases already known; comparison with words of opposite meaning; learning "keys" such as endings that indicate definite meanings. Pictures with Spanish sentences to be read by suggested methods. Ending "ero" explained; endings "a" and "ita" compared.

**Some Rudiments of Elementary Constructions** (Unit III, 35 frames). Simple constructions explained; compared to English. Pictures with Spanish sentences illustrating constructions and giving practice in reading.

**Idioms and Expressions of Courtesy** (Unit IV, 34 frames). Explanation of "idiom"; indication of importance of learning idiomatic expressions as thoughts, not as individual words. Examples of English idioms. Series of Spanish idioms with illustration from which class is to determine meaning. Expressions of courtesy given, illustrated by the social situation to which they apply.

**Two Simple Narratives** (Unit V, 39 frames). Two stories presented in drawings and Spanish sentences, with suggestion that students watch for words and expressions from preceding filmstrips and note their use in the stories: "La Hormiga y la Langosta" and "Una Leccion de Cortesia."

**Marzo y el pastor** (Unit VI, 30 frames). Story based on old Italian folk tale, explaining why March has 31 days. Line drawings illustrate the story.

**A Comedy in Three Acts** (Unit VII, 39 frames). Story of a young man who lost the opportunity to make an impression on "the girl"—"Fabula del Joven Que No Estudiaba Nunca o No Se Sabe Cuanto Valdran los Estudios." Presented in play form, acts indicated in Spanish, list of characters given in Spanish, dialogue in Spanish. The story involves high school boys and a girl.

**Mexico—Points of Interest and Bull Fight** (Unit VIII, 42 frames). Drawings, with Spanish phrases and text frames of places such as Palace of Cortes, Xochimilco, Chapultepec, Popocatepetl, Taxco. Bull-fight sequence shows various events, and the participants.

**A Mexican Farm Family** (Unit IX, 26 frames). Members of the family, their homes, and various activities, such as going to market, school, washing clothing, making tortillas, siesta, sewing class, meeting tourists.

**Dances and Music** (Unit X, 48 frames). Several dances explained in Spanish text frames; illustrations of various figures in each dance; dances include among others: "Los Viejitos," "Las Canacuas," "El Jarabe," "Danza de las Plumas." The song sequence presents two-part arrangements of music, with lyrics in Spanish. Songs include: "Las Mananitas," "La Casita," "La Golondrina," "El Tortillero," "Charrada," "San Sereni," "Vibora de la Mar," "Duerme Pronto," "Himno Nacional de Mejico."

**Latin** (SVE, 15 films, si, manuals). Each filmstrip consists of a series of uncaptioned photographs of paintings, drawings, sketches, reliefs, and statues with some photographs of existing remains depicting Roman life in terms of the individual titles. The strips cannot be used without the information of the type supplied in the manuals that identify the illustrations. The series may interest some Latin classes as supplementary material and may also be of use in ancient history, history of art, and architecture classes. Individual titles are listed below.

**The Family** (46 frames).

**Children** (37 frames).

**Costumes** (50 frames).

**Houses** (45 frames).

**Furniture** (41 frames).

**Food and Meals** (48 frames).

**Ceremonies** (43 frames).

**City Life** (41 frames).

**Mythology** (46 frames).

**Moments of History** (40 frames).

**Country Life** (50 frames).

**Games and the Theater** (48 frames).

**Amphitheater** (38 frames).

**Circus** (33 frames).

**Water Supply** (37 frames).

**Business Life** (57 frames).

**Roman History** (35 frames).

**How the Romans Traveled** (47 frames).

**The Arts** (39 frames).

**Ancient Stories in Painting and Sculpture** (36 frames).

**The Story of the Aeneid** (SVE, 2 filmstrips, si, 38 frames each, manuals). Photographs of friezes, paintings, drawings, sketches, and sculpture showing the adventures of Aeneas. No text or captions in the filmstrip. The use of information of type supplied in manuals is necessary, since the events or scenes are not



identified otherwise. Part I includes the wanderings of Aeneas from his home in Troy; Part II, Aeneas' wanderings on way to Italy.

See also the following series and individual titles for supplementary, illustrative, or related materials:

Ancient Roman Life

Ancient Rome

Life in Ancient Rome

Roman Forum

Rome Series

The Odyssey

# Literature

Two general types of subject matter in literature are approached in filmstrip—the biographical and the illustrative. In general, those concerned with biographical data consist of a few scattered details and the pictorial material does not assist



From color filmstrip "Ivanhoe." (*Pictorial Films.*)

as much as it could either in presenting the authors as real people or in visualizing their mode of life or the customs and problems of their era.

Of the illustrative type, the older productions often provide illustrations for a few major events or characters, usually either through reproductions of available paintings or by photographs of dramatizations. Such treatment lacks continuity, or has the disadvantage (since readily available materials were often utilized) that scenes were selected other than those which the instructor might wish shown. Some of the newer materials illustrate the entire story in drawings, making it possible for the instructor to select scenes or to show the entire story as desired. Even though some teachers may feel that filmstrips showing the



entire story may prematurely reveal the plot and thus lessen reader interest, others may prefer students to have a visual synopsis before reading. In any case, this type of material can be helpful in review.

The recently produced filmstrips on Dickens's "Tale of Two Cities," based on the Metro-Goldwyn-Mayer motion picture of the same name, open an entirely new field of filmstrip treatment of the classics. These strips are designed as definite direct teaching material, to stimulate thinking and interpretation, and present study questions on plot, character, and historical background instead of the usual straight plot-summary treatment.

Another interesting treatment, found in a very few strips, is the reproduction of contemporary illustrations from early editions. These aid in approaching more closely the contemporary concept of the author's characters and plot, often throwing light on the relationship of the work to the problems or conditions of the period.

Although there are a number of strips in this field, there is a need for a wider scope of materials and a variety in treatment.

The filmstrip can contribute to the literature class by

1. Showing dress, customs, and manner of life of the age portrayed in the work being studied.
2. Illustrating the setting and characteristics of the region, tracing journeys, or explaining related material, such as discoveries or explorations or historical events.
3. Assisting the student in understanding the material read and giving him a feeling that it has a basis of reality.
4. Providing a method for rapid review.
5. Presenting a basis for discussion of relationships between the work studied and the era it portrays, or the period in which it was written.

**American Authors** (Eye Gate, 12 strips, si). Each strip in the series presents some biographical data concerning the author mentioned in the individual title, followed by illustrated quotations from the works of that author. Mainly photographs, with brief text frames. The films present more of the author's works than of biographical data, which is in most cases adequate except in the strips on Lowell and on Whittier. Close-ups of enacted scenes from books tend to be outmoded in acting techniques, costume, and make-up. These strips may be of interest as supplementary material in high school classes. Individual titles with brief descriptions follow.

**Washington Irving** (72 frames). Biography: birthplace, home at Irvington, death, and burial place. Scenes from "Sketch Book," "Rip Van Winkle," and "Legend of Sleepy Hollow."

**Henry Wadsworth Longfellow** (64 frames). Biography: birthplace, interior of childhood home, Bowdoin College, Craigie House, burial place. Quotes from "Village Blacksmith" and "Psalm of Life."

**John Greenleaf Whittier** (72 frames). Biography: birthplace, Haverhill Academy, home in Amesbury, burial place. Quotes from "Barefoot Boy" and "Maud Muller."

**James Russell Lowell** (75 frames). Biography: birthplace. Quotes from "First Snowfall," "Biglow Papers," and "The Courtin'."

**Oliver Wendell Holmes** (72 frames). Biography: birthplace, Cambridge, education, work at Harvard. Quotes from several poems.

**Nathaniel Hawthorne** (68 frames). Biography: birthplace, Salem, relation of Salem to his works. Scenes from "House of Seven Gables."

**William Cullen Bryant** (75 frames). Biography: birthplace, childhood home, Williams College, house at Roslyn, Long Island, burial place. Quotes from "The Skies" and "The Crowded Street."

**James Fenimore Cooper** (74 frames). Biography: residence in Coopers-town, estate, memorial, the Cooper Lily, grave and church, Otsego Lake and relation to his stories—various scenes that figure in Cooper's tales, illustrating quotations from his books.

**Edgar Allen Poe** (66 frames). Biography: birthplace, education, West Point, marriage, home near Fordham, death of wife, suffering and misunderstanding of Poe. Quotes "Annabel Lee."

**Mark Twain** (81 frames). Biography: home in Hannibal, scenes near Hannibal that are locale of "Tom Sawyer" stories, as pilot on Mississippi, New York City home, death. Quotes from "The Jumping Frog."

**Walt Whitman** (74 frames). Biography: birthplace, education, work in printer's trade, home in Camden, service in Civil War hospitals, grave. Sequence of portraits alternating with famous sayings of Whitman. Quotes from "Leaves of Grass."

**Ralph Waldo Emerson** (78 frames). Biography: birthplace, education, minister and farewell sermon, visit to Europe and his reactions to travel, the Old Manse. Quotes "Mosses from an Old Manse" and "Music."

**American Literature Series** (SVE, si, 9 filmstrips). The first 6 filmstrips, titles listed below, consist of photographs of paintings by Joseph Boggs Beale illustrating major events in the stories indicated by the titles. Each illustration carries a brief quotation from the book or poem. While these strips do not illustrate the entire story, they do provide pictorial material showing the costumes and manner of life.

**Ben Hur** (33 frames).



**Courtship of Miles Standish** (22 frames).

**Evangeline** (24 frames).

**Hiawatha** (26 frames).

**The Village Blacksmith: Paul Revere's Ride** (34 frames). This strip also includes some biographical material on Longfellow.

**The Other Wise Man** (62 frames). Lengthy text frames alternating with pictorial material. The other 3 filmstrips in this group are described individually below.

**Uncle Tom's Cabin** (68 frames). Text and illustrations (drawings, paintings, sketches, maps) alternate, portraying major events and characters.

**Uncle Tom's Cabin** (Background of Story) (40 frames, manual). Uncaptioned photographs and maps providing historical information concerning slavery, slavery disputes of the times, Harriet Beecher Stowe, the "abolitionists," Underground Railroad, plantations and homes, various localities of the story such as Canada, Louisiana, the Mississippi. Requires information of type supplied in manual.

**Tales of the White Hills** (31 frames, manual). Uncaptioned photographs of localities in the White Mountains that furnish the locale for Nathaniel Hawthorne's tales. Cannot be used without information of the type supplied in the manual, since the photographs cannot otherwise be identified or related to the stories. Supplementary material.

**Arabian Nights** (Filmette, 2 filmstrips, si). Reproductions of Edmund Dulac's illustrations of the Arabian Nights. Each story has about 15 frames of illustration. Identifying captions in French, German, and English. Contents of the two parts listed below.

**Part I** (No. 279, 78 frames). "Tale of the Fisherman and the Ghost"; "Tale of the Prince Changed into Stone"; "Tale of the Three Calendars"; "Princess Badura."

**Part II** (No. 280, 81 frames). "Ali Baba and the Forty Thieves"; "Aladdin and the Lamp"; "Sinbad the Sailor"; "Tale of the Enchanted Horse."

**British Authors** (Eye Gate, 10 films, si). Similar to the American Authors' Series described above, these films are composed of photographs and text frames providing some biographical data and illustrated quotations from one or more works of the authors indicated in the individual titles. The illustrations of quotations often are enacted scenes with acting technique, mode of hairdress, and costuming somewhat outmoded, particularly in close-ups of the women actors. The biographical material is brief, particularly in the case of the strips on Stevenson, George Eliot, and the Brownings. May interest high school classes

in literature as supplementary material, if student reaction to outmoded scenes is not undesirable. Individual titles with brief descriptions follow.

**Charles Dickens** (57 frames). Biography: birthplace, boyhood hardships, burial place, success factors. Illustrations of locale and characters in "Old Curiosity Shop," "Tale of Two Cities," "Oliver Twist," "Martin Chuzzlewit," "David Copperfield," "Pickwick Papers," and "A Christmas Carol."

**Robert Louis Stevenson** (40 frames). Biography: birthplace, life at cottage in Edinburgh. Quotations from various works, mainly poems.

**Alfred, Lord Tennyson** (70 frames). Biography: birthplace, education, home on Isle of Wight, estate in Sussex, burial place. Quotations from "Break, Break, Break," "Home They Brought Her Warrior Dead," and "Crossing the Bar."

**Sir Walter Scott** (65 frames). Biography: birthplace, education, Abbotsford, baronetcy, failure of publishers, Scott's attempts to pay off all claims, trip to Italy, burial place, memorials, importance of his writing. Locale, quotations, and scenes from "Lady of the Lake."

**Robert Burns** (49 frames). Biography: birthplace, love affairs mentioned briefly, death, memorials. Quotations from "Auld Lang Syne" and several pastoral lines from various poems.

**Oliver Goldsmith** (76 frames). Biography: birthplace, education, poverty and death, personal characteristics, and style of writing. Quotations from "The Hermit."

**Percy Bysshe Shelley** (65 frames). Biography: birthplace, education, expelled from university, love of the sea, death, dislike by contemporaries. Quotations from "The Cloud" and "Ode to the West Wind."

**The Brownings** (80 frames). Biography: life in Italy, memorials, death of Robert Browning. Quotations from Elizabeth Browning's "Romance of the Swan's Nest" and a few other lines. Some data on characteristics of Robert Browning's work.

**William Shakespeare** (49 frames). Biography: birthplace, grammar school, Ann Hathaway, their home, scenes of present-day Stratford upon Avon, memorials, Memorial Theater. Poem about Shakespeare illustrated with views of the town and the river.

**English Literature Group** (SVE, 18 films, si). The first 10 filmstrips, titles listed below, consist of photographs of Joseph Boggs Beale's paintings illustrating various events and scenes in the stories or plays indicated by the individual titles. Each illustration carries a brief quotation from the work being illustrated. While these films do not illustrate the entire work, they do provide pictorial material showing costumes, manner of life, and settings.



- A Christmas Carol (22 frames).
- Elegy Written in a Country Churchyard (32 frames).
- John Gilpin's Ride (20 frames).
- Lady of the Lake (28 frames).
- Pilgrim's Progress (24 frames).
- Merchant of Venice; As You Like It (24 frames).
- Hamlet (17 frames).
- Merry Wives of Windsor (14 frames).
- Othello (14 frames).
- Romeo and Juliet (17 frames).

The following 7 filmstrips, described briefly below, consist of uncaptioned photographs of paintings, woodcuts, locales, and similar material. Information of the type supplied in the manuals is required to identify the pictorial material.

**Gray's Elegy and Byron's Prisoner of Chillon** (16 frames, manual). Locale of each of these selections. "Prisoner of Chillon"—mainly interiors and exteriors of the castle. "Gray's Elegy"—the chapel and the graveyard.

**Idylls of the King** (40 frames, manual). Reproductions of woodcuts, drawings, and paintings illustrating these poems at random, also photographs of locale such as the castle and the rocky seacoast.

**Kenilworth** (31 frames, manual). Photographs of paintings and woodcuts illustrating this story and also of locale as it now appears.

**Life of Robert Burns** (30 frames, manual). Various biographical data such as portraits, interiors and exteriors of home, travels, statues, and monuments.

**Life of Dr. Samuel Johnson** (32 frames, manual). Portraits, paintings of events of life of Johnson, locale in which he lived, some contemporaries, furniture, buildings, customs and manners of period.

**Merchant of Venice** (38 frames, manual). Opens with a few scenes of locality in which he lived and some portraits of author. Major portion shows various scenes from play, as enacted on a stage, and some famous paintings based on this play.

**Tom Brown's School Days** (26 frames, manual). Locale of this famous story—Rugby School, campus, buildings. Statue and portrait of author included.

The last strip in this group, described below, consists of paintings, drawings, and sketches with no captions or text. The manual supplies required identifying information. The organization is not clearly defined as data concerning the period and biographical material are intermingled.

**Life and Times of Shakespeare** (47 frames, manual). Various localities and events in life of Shakespeare and of time during which he lived: Shakespeare's

home, interior and exterior; cathedrals and churches of era; people of the era; fencing, bullbaiting; inns; the Globe Theater, handbills, title pages; the modern Memorial Theater in Stratford upon Avon.

**Fiction Films** (Pictorial, 10 films, si, color). These filmstrips, announced also as entertainment, present the basic plots of a number of familiar books often contained in school reading lists or studied in class. Color drawings with superimposed captions present the story of each of the tales indicated by the individual titles. All major events and characters are included, only minor deletions being made from the entire plot. Settings and costumes are well depicted. The captions, in general, are brief (one to three lines) and are either direct quotations from the original story or condensations that preserve to considerable extent the style of the original. The color used tends toward vivid hues and the pictures are mainly medium shots with little variety in distance. Both color and drawing technique are more suitable for the adventure tales than for other types. Although each strip, necessarily, is very long, showing by selected sequences can be utilized if desired. The films are suitable for use with classes studying or reading the tales visualized and particularly for review purposes. The series may also be of interest for auditorium purposes. Individual titles follow. Descriptions are not included since the titles are self-explanatory, but additional information is supplied where necessary.

**Ivanhoe** (105 frames). Based on Sir Walter Scott's novel.

**Treasure Island** (102 frames). Based on Robert Louis Stevenson's novel.

**The Three Musketeers** (105 frames). Based on Alexander Dumas's novel.

**Rip Van Winkle** (115 frames). Based on Washington Irving's story. Color softer and drawing technique adapted to mood of this tale.

**Robinson Crusoe** (100 frames). Based on Daniel Defoe's story. Some very long captions.

**Alice in Wonderland** (97 frames). Based on Lewis Carroll's fantasy. A number of close-ups.

**A Christmas Carol** (106 frames). Based on Charles Dickens's tale. Some very long texts. Scrooge and the Spirits heavily caricatured.

**King Arthur** (96 frames). Adapted from old legend. Includes raising of Arthur and childhood, drawing the sword from the anvil, marriage of Uther and Ingraine, Merlin's story of Arthur's birth, knighting and crowning of Arthur, Griflet's and Arthur's battles with Knight of the Spring, the Lady of the Lake and the sword Excalibur, meeting and marriage with Guinevere, formation of the Table Round, Seat Perilous. May be of interest for use as introduction to Tennyson's "Idylls of the King."

**Moby Dick** (98 frames). Based on Herman Melville's novel. Storm and whale sequences particularly well visualized.



**The Odyssey** (97 frames). Adapted from the Odyssey of Homer. Following events in some detail, with others mentioned briefly: Cyclops, the bag of winds, Circe, passing the sirens, Charybdis and Scylla, Calypso. Color and drawings among best in series.

**Goethe** (Filmette, No. 274, si, 129 frames). Biographical material including portraits of Goethe and of his parents, birthplace, drawings made by Goethe at various times, his study in Frankfort, garden house, the old Weimar court theater, his friends. Reproductions of several pages of manuscript and title pages including those of "Faust," followed by contemporary paintings based on scenes from "Faust." Identifying captions in German, French, and English. Good biographical material, suitable for high school or college classes studying this writer.

**Gulliver's Travels** (Filmette, No. 278, si, 73 frames). Reproductions of illustrations made by T. Morton for the edition published in 1875 in London. Shows the high lights of Gulliver's journey to Lilliput and to Brobdingnag. Brief identifying captions in French, German, and English. Excellent reproductions of these old drawings. Good illustrative material for any classes studying this work.

**Robin Hood** (Stillfilm, films No. H-18 and H-19, si, about 30 frames each). Part I contains the following tales of Robin Hood: in Sherwood Forest, Richard the Lionheart on Crusade; plotting of Prince John; how Robin Hood became an outlaw; Lady Marian; Friar Tuck; recapturing stolen goods; help to needy. Part II continues with return of Richard the Lionheart; outwitting of Sheriff of Nottingham; capture of Nottingham for Richard; rescue of Lady Marian from Prince John; Richard saving Robin Hood from execution; the wedding. Text and pictorial material alternate to provide summaries of these tales. Major part of pictorial material from early motion picture. Suitable for classes reading these tales, and may also interest history classes as supplementary material.

**Tale of Two Cities** (Popular Science, 3 parts, si, teacher's guide). This three-part filmstrip presents a new filmstrip approach to subjects in the field of literature. Each part is designed for active student participation and for actual study of the novel and is not intended to retell the story as most other strips in this field do. The pictorial material consists of well-selected stills from the MGM feature-length motion picture of the same title. Each picture carries a brief caption either summarizing what is being shown or presenting a question for student discussion. The strips may be used before the class reads the novel to stimulate interest and point out phases to be noted or for study while the novel is being read or as a review of the novel. This material is suitable for any group studying this particular novel, from junior or senior high school to adult groups. Individual parts with brief descriptions are listed below.

**Part I—Plot Study** (50 frames). Outlines the plot of the story, emphasizing importance to plot of document concerning Dr. Manette's imprisonment. Questions concerning the plot and its development. May be used to provide practice in narration, and arouse appreciation of story construction. Stresses significant events in plot and explains various themes and conflicts involved.

**Part II—Character Study** (46 frames). A number of the important characters shown and identified. Captions present statements or questions concerning qualities, characteristics, relationship to other characters and to plot, backgrounds, details that reveal character, reasons why certain characters are admired. In addition, provides practice in evaluation of conduct, personalities, and motives.

**Part III—Historical Background** (42 frames). Captions present questions concerning the historical background of the tale: similarities to present; attitude of English toward French; the French Revolution. Emphasis on conflict between French aristocracy and the common people; nature of the French Revolution. Leads to discussion of conflicts between democracy and despotism, discussion of novel in terms of current world conflicts, relation of understanding of history to understanding of present events.

For supplementary, illustrative, or related material, see also *Land of Evangeline* and *Story of the Aeneid*.



# Reading

A considerable number of available filmstrips have been designed for use at the primary and lower elementary level. Of these a large percentage are concerned with fairy tales and nursery rhymes. However, other material, including the newer strips, present in story form such subjects as transportation, safety, health



From color filmstrip "The Three Bears." (Young America Films, Inc.)

rules, and life in other lands. These latter films are applicable for use as cores of units that correlate reading, language, and the social studies or hygiene. A number of these new series will be found under the appropriate subject matter headings, *i.e.*, safety, physiology and hygiene, social studies.

The grade level of vocabulary, particularly in some of the older series, varies considerably; however, an attempt is being made in more recent materials to correct this. One of the newest developments in this area is the designing of filmstrips for use with specific readers. Row, Peterson and Company have just begun pro-

duction of strips for the "Alice and Jerry Readers."<sup>1</sup> Three, for use with the reading readiness books of this series, have been completed and are now available. These, while closely correlated with the books themselves, can be used in other reading readiness programs. However, films being planned for the Alice and Jerry preprimers are designed for use with those texts only. This entire project takes an entirely new approach to the problem of book and visual material correlation. Only a few frames of each strip are to be used in any one lesson; each whole strip is designed to constitute complete visualization for the reader with which it is to be used.

The new Young America Films series for lower elementary reading, "Primary Grade Stories," also considers effectively the problem of appropriate vocabulary. This group of filmstrips has been rated in reading "levels," rather than according to age or grade, so that the selection of specific strips can be governed by the progress of individual classes and individual pupils.

As the descriptions indicate, many of the films in this group consist of alternating text frames and pictures. In this case, it may be desirable for some uses to set the projector for double-frame projection (if this can be done on the projector in use) so that the photograph or drawing and its accompanying text may be seen simultaneously.

In primary and lower elementary teaching, pictorial material on charts, in books, and on flat pictures has been utilized successfully. The filmstrips provide the teacher in these grades with readily accessible illustration, which can assist in many ways, including the following:

1. Broaden the pupils' experience through illustration of situations, people, animals, etc., outside their everyday life.
2. Provide stimulus for imagination and a focus for class discussion.
3. Assist in the development of meaningful vocabulary.
4. Encourage good group attitudes by obtaining group attention, which is developed into group activity.

**Christmas in Many Lands** (Informative, si, 21 frames, manual). Reproductions of line drawings, each with brief identifying caption, showing scenes of Christmas customs in other lands, including ancient Rome, the Druids, customs of Middle Ages, England, Denmark, Sweden, Netherlands, Czechoslovakia, Italy, France, Hungary, Spain, Germany, Austria, Poland, Mexico, Bagdad. Map shows locations of countries. Suitable for elementary grades' reading, language, or social studies. Each drawing contains much detail, reducing legibility. Manual provides additional information on customs of each land.

<sup>1</sup> O'DONNELL, MABLE, and ALICE CAREY, "The Alice and Jerry Books," Row, Peterson and Company, Evanston, Ill., 1936-1947.



**Fairy Tales Series** (Filmette, 8 films, si, hand-colored). A series of untitled hand-colored drawings illustrating the story or stories indicated by the individual titles. A few of the major events in each story are shown. The teacher would need to know the story as the pictures do not present the entire tale. Individual titles follow.

**Red Riding Hood, Hänsel and Gretel, The Seven Ravens** (No. 281, 28 frames).

**Cinderella, Sleeping Beauty** (No. 282, 27 frames).

**Snow White Princess, Mother Carey, King of the Frogs** (No. 283, 28 frames).

**The Wolf and the Seven Kids, Snow White and Rose Red** (No. 284, 27 frames).

**Little Brother and Little Sister, Mary's Child** (No. 285, 27 frames).

**Lucky Jack, Puss in Boots** (No. 286, 27 frames).

**Hobgoblins, Musicians of Bremen, Brave Little Tailor** (No. 287, 28 frames).

**Cross Pig, Pilfering Little Mouse** (No. 288, 27 frames).

**Kindergarten Series** (Stillfilm, 11 films, si). Uncaptioned photographs presenting pictorial material on the individual title subjects for kindergarten and first-grade language or social studies activities. Individual titles follow with brief descriptions:

**City Fire Department** (No. P-13, about 20 frames). Various activities and equipment of a city fire department including firehouse, fire engine, hook-and-ladder equipment, and clothing worn by firemen.

**Community Helpers** (No. P-14, 14 frames). Various kinds of community helpers including policeman, fireman, mailman, ambulance driver, nurse in clinic, milk inspector, train conductor, bus driver, street cleaner, man clearing streetcar tracks, sanitation department gathering refuse. Each worker is shown in typical activity.

**Farm Animals** (No. P-15, 20 frames). Includes the following animals in their natural setting: cows, horses, mules, pigs, goats, sheep, and others.

**Home Activities** (No. P-16, 20 frames). Includes reading, setting table, eating, washing dishes, running vacuum cleaner, dusting, making beds, mowing lawn, raking, watering, wheeling baby carriage, playing with blocks, washing the porch, helping father wash car, helping mother with the sewing and ironing, children helping to cook.

**Ships** (No. P-17, 20 frames). Various kinds of ocean liners and their decks and interiors; ship in launching ways; freighters, Navy vessels, ferryboat, freight-car barge, river stern wheeler. Shows several types of wartime vessels.

**Trains** (No. P-18, 20 frames). Exteriors and interiors of engine, observation car, day coaches, diner, Pullman, rear platform, streamliners, parlor cars, club car, railroad stations, bridges.

**Postoffice** (No. P-19, 20 frames). Various activities in a city post office, including receiving of letters and parcel post, mailing letters, buying stamps, etc.

**Farms** (No. P-20, 20 frames). Views of buildings, equipment, animals, fowl, fields, and activities.

**Foreign Animals** (No. P-21, 20 frames). Includes hippopotamus, rhinoceros, elephant, water buffalo, musk ox, kangaroo, anteater, tiger, lion, leopard, giraffe, zebra, camel, llama, monkey, alligator, polar bear, and deer.

**Air Travel** (No. P-22, 20 frames). Various kinds of airplanes, exteriors and interiors including daytime seating, pilot's cockpit, sleeping arrangements, lunch, airport.

**Pictorial Alphabet** (No. P-23, 26 frames). Each frame consists of a letter of the alphabet, one word beginning with that letter and a picture illustrating the word; as, "A," airplane, and picture of an airplane. Uses photographs and drawings.

**Kindergarten Fairy Tale Series** (Stillfilm, 13 films, about 30 frames each). Each strip presents the story of the fairy tale with alternating text frames and drawings that illustrate the major points. The text frames may either be read by the teacher or used in second or third grade for reading practice. The text is very legible. "Mother Hubbard" and "The Gingham Dog and The Calico Cat" use the poem as text. Individual titles follow.

**Jack and the Beanstalk**

**Robinson Crusoe**

**Cinderella**

**Puss in Boots**

**Peter Rabbit**

**Mother Hubbard**

**Red Riding Hood**

**Little Red Hen**

**The Three Bears**

**The Three Little Pigs**

**Little Black Sambo**

**Ugly Duckling**

**Gingham Dog and the Calico Cat**

**The Lost Dog** (Popular Science, si, 40 frames, color, teacher's guide). Drawings with brief captions tell the story of Inky, a small dog, who was lost by his master Tommy. Jimmy finds the dog, takes it home, and cares for it, showing proper



feeding, bathing, visit to veterinary. Tommy finds where his dog is and goes to get him. Filmstrip ends with question "What will Inky do?" indicating that he likes both boys and must decide whether to stay with Jimmy or go with Tommy. Caption vocabulary simple; suitable for lower elementary grades reading or for reading to primary groups. Can be used to motivate proper care of pets.

**Nursery Rhyme Series** (Stillfilm, 6 films, si). Line drawings illustrating the rhymes alternate with text frames, which give from one to four lines of the rhyme. Each rhyme is given in entirety; longer ones presented with more than one illustration. Text is uncrowded and legible. Contents of each filmstrip are indicated below.

**Nursery Rhymes** (No. 1, 32 frames). "King in the Counting House"; "Ding, Dong Bell"; "Little Miss Muffet"; "Hark! Hark!"; "Three Blind Mice"; "Mary, Mary, Quite Contrary"; "Hushabye Baby"; "Sing a Song of Sixpence."

**Nursery Rhymes** (No. 2, 40 frames). "Ride a Cockhorse"; "Humpty Dumpty"; "Hey diddle diddle"; "Little Jack Horner"; "Pat-a-cake"; "Baa, baa, Black Sheep"; "Old Woman Who Lived in a Shoe"; "Jack and Jill"; "To Market, to Market"; "Pussy Cat, Pussy Cat."

**Nursery Rhymes** (No. 3, 35 frames). "This Little Pig Went to Market"; "One, Two, Buckle My Shoe"; "Eenie, meenie, minie, mo"; "Rub-a-dub dub"; "Bell Horses"; "Two Little Indian Boys"; "Three Minus One"; "Thirty Days Hath September"; "Tit, tat, toe."

**Nursery Rhymes** (No. 4, 30 frames). "Queen of Hearts"; "If I Were an Apple"; "How Many Miles to Boston"; "One Two, Three, Four, Five"; "Little Tommy Tucker"; "Handy Andy"; "Mary Had a Little Lamb"; "Tom the Piper's Son"; "Dickery, dickery, dock"; "Hickety Pickety"; "Speak When You're Spoken To"; "Two Little Dogs."

**Nursery Rhymes** (No. 5, 38 frames). "I'll Sing You a Song"; "I Like Pussy"; "Hippety Hop"; "There Was an Old Woman of Leeds"; "The Cock Crows Early"; "Little Jenny Wren"; "Two Blackbirds"; "My Son John"; "Molly My Sister and I Fell Out"; "Old Woman Lived under a Hill"; "Daffydowndilly"; "Bring the Carriage"; "Rain, Rain Go Away"; "Blow Wind Blow"; "Where Has My Little Dog Gone"; "My Little Nut Tree"; "Jack Sprat"; "Cock-a-doodle-doo."

**Nursery Rhymes** (No. 6, 36 frames). "Goosey, Goosey Gander"; "Rockaby Baby"; "Polly Flanders"; "Hot Cross Buns"; "Yankee Doodle"; "Poor Old Robinson Crusoe"; "Twinkle, Twinkle"; "Bowwow-wow"; "Farmer Went a Trotting"; "Little Boy Blue"; "I'm a Poor Little Donkey"; "Man in the Moon"; "Tommy Snooks and Betty Brooks"; "Where Are You Going, My Pretty Maid."

**Original Stories Series** (SVE, 9 films, si). Alternating text frames and drawings present original children's stories by Esther Bjoland. The vocabulary is suitable for lower elementary grades, but the text frames tend to be lengthy. Individual titles with descriptions follow.

**Billy Saves the Day** (28 frames). Billy, a baby coon, and his adventures: playing a trick on Johnny Otter; finds an umbrella and takes it home, and is scolded for this; rain begins to fall and comes into coon's house; they spread umbrella over the hole in the tree and keep dry.

**Bingo the Dog** (29 frames). Bingo chasing a chicken, rabbit, smaller dog, goose, kitten. Kitten and Bingo fight and Bingo is scratched. Emphasis on dog liking to chase anything that runs from him.

**Brave Lass of Belfry Lane** (32 frames). During seige of Leyden by the Spaniards, Dutch children raise carrier pigeons. Boy messenger through enemy lines, and his adventures taking message and pigeon to William of Orange. Return of pigeon telling William's plans to pierce dikes and drown Spanish army. Interesting story, but title is misleading. Story requires considerable historical background and explanation of a number of terms.

**The First Straw Hat** (30 frames). The story of little Betsy Metcalf, a Puritan girl, who makes herself a plaited-straw bonnet because she cannot buy the ones in the shops. Demand for these hats and establishment of prosperous hat factory by Betsy, America's first straw-hat maker. A well-told historical tale.

**For the Love of Michael** (30 frames). Peggie and Timmie visit Aunt and cousins during Easter vacation. Cousin Michael isn't nice to Peggie. He becomes ill and the doctor orders Peggie and Timmie to leave, but Peggie wants to stay and is told to think of the visit as "for the love of Michael." She watches a 4-H club play rehearsal and the leading girl forgets her lines. Peggie pretends she is acting "Lady Spring," is seen by the play director, and later is given the part since the original Lady Spring is ill. Combines many elements and is therefore somewhat difficult to follow. Stresses "moral" very heavily—reward to Peggie because she loved her cousin in spite of his unkindness.

**Friendship Village** (30 frames). Location and description of the village, the school, and children who attend it. Children giving playlets about Indian Chief Decorah, his friendliness for the white people and his escape from Chippewas. Interesting story but title is misleading, since most of the story is about the Indian chief.

**Just Make Believe** (32 frames). Little girl at home alone because her brothers do not want her with them all the time. Pretends she is running away—to the wharf, to the park, toward the dark cave. She finds something wrong with each and decides to hide. Brothers return looking for her to play ball with them.



**Puff and Buff** (32 frames). Rabbit family painting Easter eggs; twins Puff and Buff left to finish painting alone but decide to go out to play instead. Meet Big Black Rabbit who tells them he was painted black by his bad deeds, and makes them play with the other black rabbits in the black forest. When the family find Puff he is all black. While the rest of the family attend an Easter party, Puff paints a basketful of beautiful eggs with beautiful thoughts. Moral very obviously stressed.

**Silver Knee Buckles** (28 frames). Cynthia, a girl of Revolutionary days, wants to be a boy like her brothers so she can be in the army and show how brave the rebels are. The English come to the farm, take food and the cow Brindle, which is Cynthia's pet. She goes after them; tells General Cornwallis about her cow and about her brothers. He returns the cow and gives her silver knee buckles because she is a brave girl.

**Primary and Primary Stories Series** (Stillfilm, 26 films, si, about 30 frames each). Alternating text frames and photographs present stories suitable for language, reading, and social studies classes in the lower elementary grades. Individual titles with brief descriptions follow.

**Ahmed, the Desert Boy** (No. S-1). Various activities of Ahmed, including riding camels, picking dates, the evening meal, the caravan, sandstorm, visits to market place, the water sellers, bazaar, and cobbler.

**Chang and the Jungle Children** (No. S-22). Life in the jungles of Siam: houses, banana trees, pounding rice, trapping tiger, playing with monkey and elephant; baby elephant's mother comes for him and charges the village, ruining it.

**Chinese Children** (No. S-29). Views of houseboat children, village children, wealthy children, middle-class villagers, groups at mission schools, work done by poor children, Chinese Boy Scouts.

**The Eagle Dance** (No. S-14). Various phases of the dance as performed by the Pueblo Indians; text explains its meaning.

**English Children** (No. S-30). Activities and homes of English children: clothing and homes; fishing towns; playing in the water; at puppet show; city children playing in stone courtyard, hiking, playing cricket; schools, outdoor classes, honoring their King.

**Neewak and Neewah, the Eskimo Boys** (No. S-9). Activities including clothing, igloos, fishing, spearing seals, food, bed, dogsled, boats, taking skins to trader, midnight sun, play and work of the two boys.

**German Children** (No. S-36). Village houses; national costumes; school; Maypole dance, play with medicine ball, learning to swim, music class, week-

end hike, Boy Scouts and Girl Scouts, bicycling, helping farmer with hay, skiing.

**Hilda, the Dutch Girl** (Part I, No. S-7). Hilda and her sister; the wind-mills; canals; need for drainage, dikes; map of Holland; washing clothes at dike; lighthouse, canalboat houses, barges; dairy farm; stork's nest.

**Hilda, the Dutch Girl** (Part II, No. S-8). Fog bell, fishing boats; city, fish market, buying candy, butter stalls at market; costumes of other regions; dog-cart milkman; village homes.

**Homes, Present Day** (No. S-32). Various types of homes in use today: hotels and apartment houses; small suburban homes; native village homes in Greece, England, Italy, Holland, Japan, Iraq, Pueblos, China, Abyssinia, Bulgaria, Siam, and the Philippines.

**Italian Children** (No. S-38). Village homes, play, clothing, schoolwork, surrounding vineyards.

**Japanese Children** (No. S-28). Japanese family: home in mountain village, cherry blossoms, taking care of the babies, clothing, Sunday School, games, working in rice field, gathering leaves for fuel, bringing home load of bamboo. Depends heavily on text. Idealizes activities and life of these children.

**Jock and the Piper of Scotland** (No. S-26). Jock, the shepherd's son, and his work with the sheep; school; wearing of kilts. Jock's conversation with gypsy piper about Scottish soldiers, the kiltie uniforms, cricket, Edinburgh, Loch Lomond, and Boy Scouts.

**Little Bear, the Indian Girl** (No. S-13). Caring for papoose, living in hogan, playing with lamb as a live doll, talking to little white boy in sign language, making fire, making bread, weaving.

**Little Jeanne of France** (No. S-25). Story of Jeanne living in Paris with wealthy relative, unhappy and homesick. Shows aspects of her former life in country and of her life in Paris. Ends with her return to the country. Tells little about French life, but good views of Paris and of countryside.

**Maria, the Potter** (Part I, No. S-1). Maria, Pueblo pottery maker, and Julian, her husband, who paints designs on her finished pottery. Children sent to get clay and the plants needed for making pottery. Preparation of paints from plants; equipment used. Kneading the clay, shaping bowls, applying slip, polishing, and sun drying.

**Maria, the Potter** (Part II, No. S-19). Julian painting the sun-dried bowls. Types of designs used. Preparation for firing; firing the pottery; cooling; visitors and tourists select those they wish to purchase; use of money from pottery sales for a new home.



**Mexican Children** (No. S-31). General information about life and activities of peon children: clothing, pets, homes, making tortillas, bathing in stream, doing laundry, scarcity of water, water sellers, village well, market day, school, vaccination by government doctor, dancing.

**Pueblo Village Children** (No. S-11). Houses and village, clothing, carrying of water jars, the "kiva," pottery, grinding meal, baking bread, drying meat, gathering firewood, corn-harvest festival, costumes for dances.

**Pueblo Indian Dances** (No. S-12). The Pueblo dances: costumes worn; explanation of why such dances are held, including rain dances and harvest dances.

**Safety First** (No. S-44). Safety precautions: obeying school safety committee rules; policeman as helper in crossing streets; children causing accidents by carelessness or disobedience; need to obey traffic signals.

**Story of Milk** (No. S-42). Begins with information about Holstein cows in pasture and barn and farmer's work in milking and keeping cows and milk clean. Delivery of milk to milk train; city dairy; pasteurizing and bottling; delivery to homes.

**Swiss Children** (No. S-37). Mountain home, village, clothing, play, helping with animals and with haying, winter activities, school.

**Tunyo, the Little Drummer of Taos** (Part I, No. S-16). General data about Taos Indians: village, clothing, making mocassins and vests; mothers' work in winnowing wheat, baking in outdoor ovens; Tunyo as a lazy boy—playing, climbing ladders, hiding with goats.

**Tunyo, the Little Drummer of Taos** (Part II, No. S-17). Tunyo learning how to play drums; runs away and hides; village drummer calls people to dance, but Tunyo not permitted to watch since he was too lazy to learn the dances with other children. Tunyo later tries to learn by himself. Decides to learn how to play drum well, and works hard. Now drums for visitors to village and is little drummer of Taos.

**Young Kelleys of Ireland** (No. S-24). Village house, clothing, going to school, town market, Dublin, signs in Gaelic, donkey carts, working on farms.

**Primary Grade Stories** (Young America, 24 filmstrips, si, 35–50 frames each, color, teacher's guide). This new series on familiar fairy tales and children's stories was designed for use as supplementary reading material in the lower elementary grades. Color drawings with brief superimposed captions present each of the stories indicated by the individual titles. The drawings are clear and present an easily assimilated visual image since unnecessary detail is omitted. Long shots, medium shots, and close-ups are employed as indicated by the needs

of the story, providing pleasing variety and emphasizing the incidents of the story as they are presented. The captions are simple in vocabulary and in sentence structure. Each strip is rated according to reading level rather than age or grade since reading levels in specific primary grades differ in different schools. Individual titles are listed below alphabetically with indications of reading level for which the vocabulary of each is suited. Descriptions are not provided, since the treatment of all subjects is consistent.

**The Boy and His Goat** (last of the second level or beginning of the third).

**The Boy Who Went to the North Wind** (third level).

**The Cat Who Lost His Tail** (third level).

**Chicken Little** (last of the first level or beginning of the second).

**Cinderella** (last of the second level or beginning of the third).

**Dee Dee Chou** (last of the third level or beginning of the fourth).

**The Dog and the Cat** (last of the second level or beginning of the third).

**Drakestail** (last of the second level or beginning of the third).

**The Four Musicians** (third level).

**The Gingerbread Boy** (last of the first level or beginning of the second).

**Hänsel and Gretel** (last of the second level or beginning of the third).

**Jack and the Beanstalk** (last of the second level or beginning of the third).

**Kofi** (last of the second level or beginning of the third).

**The Lion and the Mouse** (last of the second level or beginning of the third).

**Little Black Sambo** (last of the second level or beginning of the third).

**Little Red Hen** (last of the first level or beginning of the second).

**Little Red Riding Hood** (last of the first level or beginning of the second).

**Noah and the Ark** (last of the second level or beginning of the third).

**Puss in Boots** (third level).

**The Rabbits and the Frogs** (last of the second level or beginning of the third).

**Rumpelstiltskin** (third level).

**The Straw Ox** (third level).

**The Three Bears** (last of the first level or beginning of the second).

**The Three Little Bears** (last of the first level or beginning of the second).

**The Three Little Pigs** (last of the first level or beginning of the second).

**Primary Reading Series** (SVE, 31 films, si, from 40 to 70 frames each). Text frames and drawings present the following well-known fairy tales and other children's stories. In general, the text frames tend to be lengthy and in many strips outnumber the pictorial frames. The block letters used are very legible. Vocabulary suitable for lower elementary grades, varying in difficulty from third



grade to fifth grade. In a few strips the drawings and text appear on the same frame, reducing legibility of both. Individual titles are listed below.

Adventures of a Brownie

Beauty and the Beast

Brother and Sister

Cinderella

Brakestail

East of the Sun and West of the Moon

Flapsy Flopper of the Farmyard

The Flying Ship

The Fox and the Little Red Hen

The Frog Prince

Hootie Toots of Hollow Tree

Indian Child Life

Jack and the Beanstalk

King Thrushbeard

Lad Who Went to the North Wind

Little Black Bear

Little Black Sambo

Little Red Riding Hood

Night Before Christmas

Peter Rabbit

Peter Rabbit's Easter

Puss in Boots

Rapunzel

Rumpelstiltskin

Scrapefoot and the Three Bears

Sleeping Beauty

Three Pigs

The Tin Soldier

Tom Thumb

Water Babies

Wynken, Blynken, and Nod

**Primary Reading Set** (Stillfilm, 6 films, si, about 30 frames each). Each strip opens with a series of about 10 drawings showing activities of Jimmy and Nancy. This is followed by the same drawings with each preceded by a brief caption in vocabulary suitable for first-grade reading. The first uncaptioned series of drawings may be used for class discussion and for development of vocabulary prior

to reading of the captions in the second sequences. Individual titles with brief descriptions follow.

**The Little Housekeeper** (Primary Reader No. 1, Nancy Unit). Nancy's home; Nancy playing with dolls, having tea, sewing, washing, going to bed.

**The Homeworker** (Primary Reader No. 2, Jimmie Unit). Jimmie at play with his dog, gathering eggs, with organ grinder, playing with kitten, getting ready for bed.

**Starting Right** (No. 3). Morning activities: getting up, dressing, breakfast, brushing hair, feeding pet.

**Children at Work** (No. 4). Children working: at school, repairing toys, caring for goat, in garden, drying dishes, listening to story.

**Community in Action** (No. 5). Parade, band, policeman, picnic in park, monkey in zoo, giraffe, fruit stand, buying white rat as pet, driving home in car.

**Indian Life** (No. 6). Indian village, wigwams, dances; children playing Indian, Indian suits, book about Indians—"Hiawatha"—pictures of Hiawatha. Indian village sand table.

**Reading Readiness Series** (Row, Peterson, 3 films, si, manuals). Designed specifically for use with the reading readiness books of the Alice and Jerry series—"Here We Go" and "Over the Wall." However, these strips can be incorporated into other reading readiness programs if desired. The beginning of each strip consists of a few text frames for the teacher, indicating purpose and use of the strip, stressing the fact that these materials were not designed for showing in entirety. All three should be useful, in the development of experience backgrounds and environmental vocabularies. The pictorial material in general is good, using many close-ups and avoiding confusing detail both in the drawings used in the first strip and in the photographs used in strips two and three. Individual titles with brief descriptions follow:

**Tell Another Story** (52 frames). Opening frames indicate that teacher should tell the old folk tales to the children prior to showing the strip. As the strip is shown, one story at a time, the children are to retell the story from the pictured clues of the story's events. Each of the following tales is presented in a few uncaptioned drawings showing the major incidents: The Pancake (10 frames), Three Billy Goats Gruff (6 frames), The Three Little Pigs (11 frames), Old Woman and Her Pig (14 frames), The Elves and the Shoemaker (11 frames).

**I Live in the Country** (50 frames). Opening frames indicate that the teacher should read the captions as the strip is being shown and that only a few



frames should be used at any one time. Photographs of farm life, with brief captions, include farmer and wife, buildings, cattle, barn, sheep, hen, chicks, chicken house, ducks, ducklings, goose, goslings, turkeys, dogs, donkey, pony, horses, hay wagon, silo, husking corn, tractor, mailbox, country school, small town, swimming hole, fishing in small brook, orchard, gardens, winter on the farm.

**I Live in the City** (50 frames). Opening frames indicate that the teacher should read the captions as the strip is shown and that only a few frames should be used at any one time. Photographs of various aspects of city life, with brief captions, include apartment houses, individual houses, traffic police, going to school by bus, playground, street cars, newsstand, parking lots, fathers working at different types of jobs, milkmen, mailmen, markets and stores, mailboxes, garbage collectors, street sprinklers, firemen, movie theater, elevators, view from high building, park, church, ambulance and hospital, beach, amusement park, airport, zoo, aerial views of large city.

**Story of Heidi** (Popular Science, si, 44 frames, color, teacher's guide). This strip presents an entirely new filmstrip approach to treatment of stories and is designed to stimulate interest in reading. Instead of presenting the entire tale, as most other story strips do, only two incidents are presented—Heidi's day with Peter and the sheep on the mountain, and her visit to Peter's grandmother. The opening frames permit Heidi to introduce herself. The end frame asks whether the viewers wouldn't like to go on more adventures with Heidi and her friends, and suggests reading the book. The two incidents shown in the strip are presented in detail, using color drawings with brief superimposed captions and a few text frames. A solid black background appears under both captions and text, which aids legibility but in some cases overpowers the delicate tints of the drawings. This is particularly true of the text blocks that are centered over a color drawing background. The color tones used are admirably suited to the mood of the story itself, and the drawing technique is good.

**Story-time Picture Tales** (Curriculum, 15 films, si, 25 frames each, color). This recent series was apparently designed to provide pictorial retelling of familiar children's stories. Color drawings with superimposed captions present the major incidents in each tale. While the vocabulary of the captions is simple, the captions are long, from two to four lines. The color stresses vivid hues and the darker values; the color treatment is suited to adventure tales but less suitable for the delicate mood of many fairy tales. The drawings often contain considerable detail and lack distance variety, since medium shots are used almost exclusively with a few close-ups in some of the strips. Individual titles are listed below. Descriptions are not included since the treatment of the entire series is constant.

**The Animal Musicians (No. 1).**

**Change About (No. 2).**

**Cinderella (No. 3).**

**The Fisherman's Wife (No. 4).**

**The Gingerbread Boy (No. 5).**

**Jack and the Beanstalk (No. 6).**

**Lazy Jack (No. 7).**

**Mr. Vinegar (No. 8).**

**Peter Rabbit (No. 9).**

**The Pied Piper (No. 10).**

**Puss in Boots (No. 11).**

**Rumpelstiltskin (No. 12).**

**Three Billy Goats Gruff (No. 13).**

**Thumbelina (No. 14).**

**The Ugly Duckling (No. 15).**

**Three Billy Goats Gruff** (Photo & Sound Prod., si, 26 frames, color). Twenty-six drawings in color illustrate this well-known fairy tale. No captions or text used. The teacher may tell the story as the strip is shown or pupils may relate the story. Drawings are lively and spirited, illustrating the story almost completely. Good material for kindergarten and primary reading and language.

**Thrift Education** (Stillfilm, No. S-20, si, 30 frames). Line drawings and brief text frames explain how the following animals work and gather and store food: bees, squirrel, woodpecker, ant. How Uncle Ned works—storing food for animals of farm and storing fruits and vegetables for winter use. Aunt Mary making jellies and pickles; Cousin Nell raising chickens, putting money in bank; Cousin Bob raising vegetables and selling them. City child—saving old papers to sell to junkman, sister sewing and saving scraps from dressmaking, saving time by never being late, using book covers, putting errand money in school savings bank. Suitable for primary or lower elementary grades. Part I presents general examples of thrift; sequence beginning with city child (called "I" in the strip) presents definite thrift examples for children, using a direct approach and suggesting good thrift habits directly.

**Transportation Series** (Long, 3 films, si). The story of Mary, a little girl, traveling. The strips show various activities and the things that Mary sees. Each strip ends with a list of words to remember and a list of related reading material. Very good material for lower elementary reading classes, particularly third and fourth grades. Individual titles with brief descriptions follow.

**Mary and the Indians** (28 frames). What Mary sees on her visit to Uncle Tom at the Grand Canyon: the hotel, the Old Watchtower; the Indian



village; Hopi and Navajo Indians; pottery, dances, grinding of corn, silver-smith, weaving; relief map of Grand Canyon; views of the Canyon.

**Mary's Trip by Air** (33 frames). Story of Mary's trip in a plane with her mother: the airport, getting tickets, checking bags, exterior of plane, fueling, food preparation in airport kitchen, the take-off, pilot's instrument board, lunch on the plane, air view of city, writing letters, sleeping, control tower, and landing.

**Mary's Trip by Train** (29 frames). Story of Mary's train ride to visit her Uncle Tom: going to the station, buying ticket, checking baggage, exterior and interior of train, views en route, signals, club car, eating in diner, the berth, sleeping, arrival at destination.

For supplementary, illustrative, or related material see also the section on Literature, the Lower Elementary and Primary Social Studies section, the Living in Other Lands Series, and Arbor Day.

# Safety

The filmstrips dealing specifically with safety are here grouped under one classification, even though most curriculums do not treat safety as a separate subject, because they often are pertinent to more than one course or may be desired for other uses such as in clubs or for assembly programs. An example of the multiple use is the way in which industrial safety material can be applied to various high school shop courses and hobby groups in addition to vocational shop classes such as machine shop or foremanship.

In spite of the fact that a large proportion of the available strips includes much negative instruction, these pictures can be easily incorporated into a positive program. Possibly a greater point of criticism than the negative instruction is the excessive length of many of the available strips. This occurs generally in those accompanied by recordings and employing a story device, which, while in some cases adding interest, adds little to teaching value.

Perhaps the greatest contribution of the filmstrip in safety instruction is that it can visualize results of carelessness or of unsafe practices, motivating a desire for safety and presenting indisputable evidence of the desirability of proper precautions. It is difficult to impress verbally upon the student's mind the results of unheeded hazards, and a well-selected picture can dramatize such results unforgettably.

Other filmstrip uses in safety instruction include

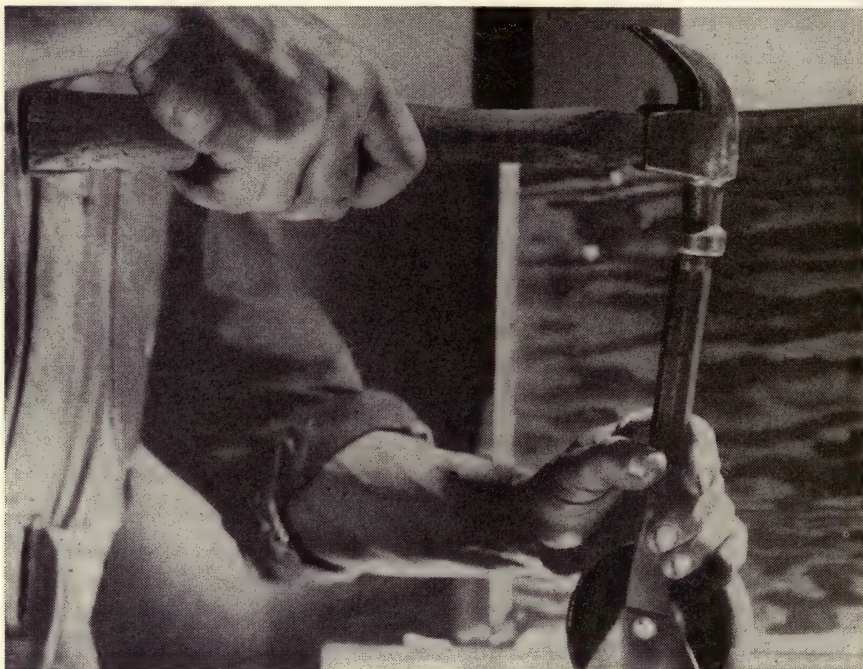
1. Reenactment of situations involving violations of safety principles.
2. Demonstration of safety procedures with equipment that cannot be conveniently shown to large groups.

## INDUSTRIAL SAFETY

**The Eyes Have It** (Nat'l Soc. for Prevention of Blindness, sd, 122 frames, 20 min, loan). Prevention of eye accidents in industry. Opens with sequence showing things that blind can do, with question "Do you want to do these things?" Series of unexpected and unusual eye accidents, emphasizing fact that eye accidents can happen anywhere and no job provides absolute safety, stressing need for goggles. Employee's objections to goggles answered. Reviews eye safety program of Pullman Company. Outlines proper goggles, proper fitting to individuals, and care of goggles. Reviews cases of accidents prevented by wearing goggles.



Includes list of "don'ts" for those who wish to protect their eyes. Good film on preventive measures for industrial workers, although a little long. May also interest senior high school or college shop and vocational courses, foremanship classes, and vocational schools.



From filmstrip "Safe in Hand." (National Safety Council, Inc.)

**The Fall Guy** (Nat'l Conservation, also Employers' Mutual, sd, 30 min, loan). Prevention of industrial accidents due to falls. Factory worker falls and a skeleton talks to him concerning causes of such accidents, pointing out the "fall spots" in the factory. Ends with summary. Includes following items: use proper ladders, keeping aisles clear, place of good housekeeping, carrying objects properly, dangers of horseplay. Good material although somewhat long. Device of "skeleton" adds little to value of strip.

**Grime Doesn't Pay** (Nat'l Conservation, Nat'l Safety Council, or Employers' Mutual, sd, 25 min, loan). Discussion of housekeeping. Cartoon character "Poor Housekeeping" is indicated as a dangerous criminal; he discusses housekeeping with a member of a cartoon group "Clean Up Squad." The discussion covers examples of poor housekeeping, their consequences in accidents, sickness, fire, loss of money and time. Effects and examples of good housekeeping. Safety

material presented is good, although the strip is long and narration inclines to use of wisecracks.

**Handle with Care** (Nat'l Conservation, Nat'l Safety Council, or Employers' Mutual, sd, 25 min, loan). Treats the subject of handling and lifting heavy objects. Cartoon character on safety poster speaks to "muscle-brained" worker concerning importance of handling problem, costs to workers and to company, results of improper handling or lifting of heavy objects. Indicates methods of avoiding injury through correct lifting, correct carrying, and use of equipment to lift or carry. Subject matter and information good; however, strip is somewhat long, the narration inclines to use of many wisecracks, and pictorial material is often static, showing men simply talking to each other instead of visualizing the information.

**Invisible Red Ink** (Nat'l Conservation, Nat'l Safety Council, or Employers' Mutual, sd, 25 min, loan). Two men on train discuss problem of accidents in factories. "Invisible red ink" as indirect costs of accidents. Discussion covers locating of accident causes, using industrial safety experts, analysis of poor habits, conduct, unsafe equipment, and environment. Indicates accident prevention measures, such as analysis of unsafe practices, correction of faults, use of safeguards and protective clothing or equipment, correct job placement, assistance on personal problems to eliminate worry. Ends with summary of persons who might direct safety programs in plants. Excellent material on safety programs, but pictorial frames do not visualize this information fully as many frames consist merely of the two men talking. Subject matter also suitable for foremanship classes.

**Open for Infection** (Employers' Mutual, sd, 30 min, loan). Stresses need for immediate attention to all injuries, even small scratches, to prevent infection. Opens with microbe seeing an open cut and calling his pals to help him infect it. Company doctor explains infection to man with small scratch and discusses the following: bacteria exist everywhere; brief history of knowledge of bacteria including discovery of optic lens microscope, Pasteur's and Lister's work in use of antiseptics; effects of three most destructive bacteria; review of what happens when microbes enter a cut. Shows many infected hands, scars, and amputations with explanation of scratch as cause. Methods of escaping infection presented: be careful and don't get hurt; if you do get hurt, get attention immediately. Good material but includes irrelevant material, such as sequence on history of discovery of bacteria, which, while interesting, makes the strip somewhat long for most class use.

**Principles and Interest** (Nat'l Safety Council, sd, 25 min, loan). Suggestions on development of health and accident records by foremen. Importance of



continual reminders and "selling" of safety to workers. The following indicated as four jobs to do in accident prevention: (1) Inspect plant for hazards; (2) study the jobs; (3) instruct for job safety; (4) develop active program to keep employee interest in safety. Shows several applications of above "jobs." Good material for foremanship classes particularly, although somewhat long and the pictorial material tends to be static, showing many scenes of men talking to each other, rather than visualizing the problem.

**Production with Safety** (Nat'l Safety Council, sd, 25 min, loan). Accident-prevention methods, with main emphasis on proper training of employees. Outlines proper steps in employee training, particularly in new jobs, including safety in job training. Proper preparation by foreman for training. Ends with suggestions for other accident-prevention methods, including the personal interview. Points out difficulty of maintaining safety campaigns when foremen are busy with other wartime problems. Pertinent material at all times in spite of application to wartime industry. Information more explicit than in "Principles and Interest" described above. Many static pictorial frames.

**Rules for Tools** (Nat'l Conservation or Employer's Mutual, sd, 30 min, loan). Incorrect handling and use of tools as accident cause. "Old Man Accident," cartoon character, talking to several damaged tools blaming them for accidents. Tools explain that fault was not entirely theirs, showing how rules for tools apply to each of them, how the accident occurred, and the effects of using tools that are damaged. Rules include use proper tool for the job; use the tool correctly; keep the tool in good condition; put the tools away when the job is completed. Tools discussed are screw driver, hammer, monkey wrench, file, and cold chisel. Probable effect or results of incorrect tool use clearly shown; device adds little to clarity of instruction. Suitable also for foremanship classes, vocational schools, and college or high school shop courses.

See also the following titles for supplementary, illustrative, or related material:

Eyes on the Job

Oh Say Can You See

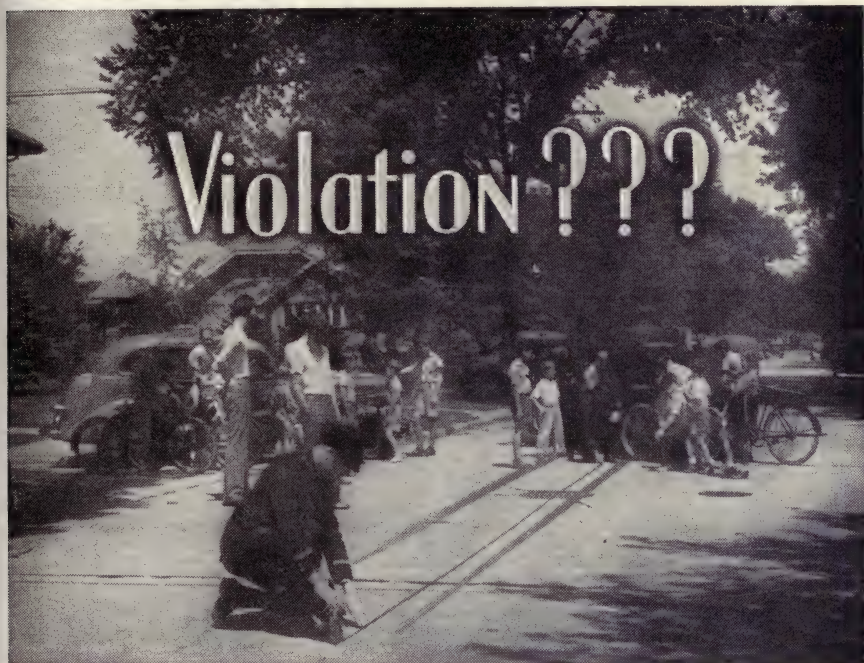
Merchandise Training Series

Fire Is Your Responsibility

## STREET AND ROAD SAFETY

**Are Your Feet Killing You?** (Nat'l Conservation, sd, 25 min, loan). The dangers of jaywalking, walking at night, and of carelessness on the part of pedestrians. A number of case histories, both adult and child, shown to indicate

right and wrong pedestrian practices. Told in story form: man injured when crossing street back of bus; the case histories discussed in hospital by man's company representative and police investigator. Stresses parent responsibility in teaching children correct practices. Suitable for high school classes or adult groups. Filmstrip is long because it includes several detailed accounts of pedestrian accidents.



From filmstrip "Selective Enforcement." (*International Association of Chiefs of Police, Inc.*)

**Inertia** (Nat'l Conservation, sd, 15 min). Inertia as a contributing cause of many accidents. Opens with explanation of inertia; its effects on driving of motor vehicles explained in detail, particularly in stopping a car. Includes also effects of centrifugal force. Indicates methods of combating inertia and the results of not heeding effects of inertia. Also points out how the mind is affected by inertia—difficulties in changing trend of thought and slowing of reactions. Excellent material for safety classes and for high school driving courses. May also be of interest as supplementary material in general science or beginning physics classes.

**Life Savers of the Highway** (International Police, sd, 18 min, loan). Discussion of necessity for all traffic police officers to be trained in first-aid methods. Indicates



results of improper treatment, handling, or transportation of accident victims. Details of first-aid training required outlined. Mainly a plea for first-aid training for police. May have some interest as supplementary material in schools. The commentary is unusually rapid and therefore somewhat difficult to follow, particularly in the sequences presenting statistical data.

**Live Longer with Light** (Nat'l Conservation, sd, 30 min, loan). The need for more and better lighting of highways. Opens with statistics on carrier accidents compared with fatalities from fire, flood, and disease. Comparison of fatalities and accidents at night with those from other causes. Indicates causes of night driving dangers and methods of combating such dangers. Good material for safety classes, particularly for high school driving courses, even though strip is somewhat long for use in one class period.

**The Man Behind the Star** (International Police, sd, 20 min, loan). Description of responsibilities, background, training, and duties of the traffic policeman in maintaining orderly traffic, promoting safety for driver and pedestrian. Good subject matter for elementary social studies, but vocabulary in narration is too advanced for this purpose. May be of interest as supplementary material in driver training courses or in vocational guidance groups. Pictorial material contains many static shots of men behind desks or of groups of men talking.

**Selective Enforcement** (Nat'l Conservation or International Police, sd, 18 min, loan). Explanation of police technique in selective enforcement of traffic laws. Opens with summary of accident rate, police manpower, and types of traffic duties. Need for complete accident reports and competent accident investigation. Outlines and explains selective enforcement technique. Data on how such a program can be worked out and statistical data gathered. Specifically designed for police training schools and police meetings.

**Stop, Look, and Live** (International Police, sd, 15 min, loan). Demonstrations of correct pedestrian habits. A postman along his route introduces a city policeman and a highway patrolman, each of whom point out and describe examples of correct and incorrect walking habits. Indicates pedestrian causes of accidents; places where it is especially important to stop and look; hazards of darkness. Good information for all groups, although vocabulary of narration is somewhat advanced for intermediate or lower elementary grades. Pictorial material contains many static frames showing men talking.

**Stop That Thief** (Nat'l Conservation, sd, 15 min, loan). An exposé of the accident-fraud racket. Development of the rackets from 1923 through 1931; losses through such rackets; persons affected by such rackets indicated as being everyone. Description of how racketeers work explained through typical case;

other fraud tricks shown. How racketeers are located; use of Index Bureau. What individuals can do to combat the racket. Good material for citizenship, government, or civics classes in high schools. May also interest adult groups. Pictorial material moves quickly and includes number of graphs and charts in addition to photographs.

**Testing the Drinking Driver** (Nat'l Conservation, sd, 20 min, loan). Importance of scientific approach to drinking-driver problem, explaining types of tests. Opens with trial in which drinking driver is acquitted on account of insufficient evidence. Explains development of testing program; use of improved police examination form for use at scene of accident; values of alcohol content tests. Explains Heise tests, Freideman tests, and Harger breath test. Legal background of tests given. Importance in exonerating innocent, convicting guilty, lowering prosecution costs, and cutting down accidents. Interesting material; both narration and pictorial material move quickly. May be useful as supplementary material in high school or college civics or government classes or as example of application of chemical analysis in chemistry classes.

**The Three "L's"** (Mo. Pacific, sd, 15 min, loan). Safety at railroad crossings. Protections by state and by railroad at crossings. Ten reasons for railroad-crossing accidents, illustrating each with line drawings of typical accidents. Ends with photographs of various accidents, showing results, approaches, victims, and possible causes. Stresses need to "look, listen, and live." Excellent safety film with good narration and pictorial content.

**Traffic Jam Ahead** (Nat'l Safety Council or International Police, sd, 20 min, loan). Discussion of the many factors contributing to the need for cooperation of motorists, pedestrians, and others to prevent a postwar rise in traffic accidents. Factors that may tend to increase accident rate if not controlled. Postwar objectives of safe roads, safe drivers, safe vehicles, and safe pedestrians given. Responsibility of public in promoting safety legislation and traffic enforcement; role of engineering, education, legislation, and enforcement in postwar traffic safety. Suitable for adult groups and high school or college classes. Will become outdated quickly, since it deals with traffic problems in the period after the Second World War.

For supplementary, illustrative, or related materials see the following series and individual titles under the Automotive Operation and Maintenance section:

Automobile Operation Series

Bus Operation Series

Safety Factors (Units of the Automobile Series)



## GENERAL

**Fire** (Nat'l Safety Council or Employers Mutual, sd, 25 min, loan). Causes and prevention of industrial fires. Opens with long sequence on factory fire caused by careless match throwing. When chief returns from fire, he discusses the problem of factory fires with worker who is visiting his home, pointing out



From filmstrip "Safety in the Home." (*Young America Films, Inc.*)

common causes and preparedness measures. Somewhat long for average length class periods. Many static pictorial frames showing persons talking instead of visualizing the subject matter being discussed. Subject matter suitable for foremanship or vocational classes.

**Fire** (Castle, made for U. S. Navy, No. SN-733, si, 40 frames). Explains the three requirements for fire—heat, combustible material, and oxygen. Five frequent causes of fires, stressing carelessness as a major cause. Demonstrates three methods of extinguishing fires: smothering, cooling, and separation of flames from burning materials. Importance of knowing fire rules and location of fire-extinguishing materials. Uses Navy men in illustrations, but should be good for safety instruction in all shop courses.

**Living Safely Series** (Young America, 4 films, si, teacher's guide). Four aspects

of hazards and safety rules in the life of modern children—machines, streets, home, and school. The material is restricted in general to activities of children—the instructor may wish to expand this into information on handling of similar hazards in adulthood. All four strips provide for active participation by class members. The first filmstrip of the series begins with 8 frames for the teacher, indicating suggestions for using filmstrips. Individual titles with brief descriptions follow.

**Safety at School and Play** (39 frames). Safety rules for school gymnasium and playground and in school corridors and on stairs. Rules illustrated; incorrect procedures shown for group discussion. Ends with general safety precautions, such as fire drills, school safety patrols, etc.

**Safety in the Streets** (46 frames). Principal causes of traffic accidents, dealing with causes of motor-vehicle accidents and with safety for bicycle riders and for pedestrians. Rules are stated briefly and then illustrated. Ends with summary.

**Safety in the Home** (42 frames). Types of accidents found in the home; how they can be avoided. Stresses need for all members of the family to cooperate in making the home safe. Home hazards shown and prevention methods indicated. Ends with summary.

**Living in a Machine Age** (42 frames). Advantages of the machine age; accidents brought about by the machine age; statistics on accidental deaths in the United States. Hazards in handling such machines as cars, bicycles, fans, etc., and methods of overcoming the hazards; comparison of safety features of old and modern machines. Ends with discussion questions on machines with hazards which are handled daily by members of group.

**Safety in the Home** (Visual Sciences, No. S-1, si, 34 frames). Small line drawings with much text material on same frame. Facts concerning safety hazards in the home and methods of combating them. Interesting subject matter, but device of including text and drawings on same frame limits the legibility.

**School Safety Series** (Nat'l Safety Council, 5 films, si). Each filmstrip deals with one aspect of safety for children. The strips consist of photographs with brief superimposed captions and a few text frames, giving the pertinent safety rules and showing correct practices and the results of incorrect practices. The series is suitable for use in elementary grades. Individual titles are listed below with brief descriptions.

**Play Safe** (44 frames). Rules for safety in play: play in safe places; correct play with various types of playground equipment; dangers of dares, tripping, teasing, playing on streets; ways of making the playground safe.



**Home Safety** (59 frames). Home safety as planned by the architect, as built by the builder, and as bought by the family in selection of furniture. Need for entire family to practice safety. Unsafe practices and their results shown; safe practices suggested.

**Safety on Two Wheels** (49 frames). Safety in bicycling. Safety features of modern bicycle. Statistics on bicycle accidents. Safety rules for bicyclers illustrated; unsafe practices and their results also shown.

**Tom Joins the Safety Patrol** (48 frames). Purpose of school safety patrols stated. Story of new boy at school who joins the safety patrol—work of patrol, patrol meetings. Correct method of crossing street if patrol is not present.

**In Case of Fire** (45 frames). Indicates helpful aspects of fire; shows what uncontrolled fire does. Discusses need for caution in handling fire and keeping it controlled, presenting information on camp fires, putting out small fires, proper care of matches, how to turn in fire alarm if necessary, and similar subjects.

**Sing a Song of Safety** (Popular Science, 5 filmstrips, si, teacher's guide). Illustrates Irving Caesar's safety songs, using the lyrics as captions, and organized so that each strip presents a group of songs related to one safety subject. Although the filmstrips are available separately, it will probably be found that they are most useful in situations where the Irving Caesar songs are already being used, or if the recordings of the songs are also purchased. While each strip contains three or more songs, each separate song sequence may be shown individually in any order desired. The subject matter of the songs is suitable for use in grades one to six in most cases; "Remember Your Name and Address" and "When Watching a Parade" (in Part II) are specifically suited to primary grades. Individual parts are listed below with brief indications of content:

**Part I—How to Have Fun** (about 30 frames). "When You Ride a Bicycle"—warning against doing tricks while riding, safe places to ride. "Let the Ball Roll"—dangers of running into street after the ball, safe places to play ball. "When You Swim"—dangers of rough water, need to learn to swim. "Ice Skating is Nice Skating"—warning against thin ice, how to tell if ice is thin, proper places to skate. "Johnny Climbs Fences and Johnny Climbs Walls"—dangers, how to climb safely.

**Part II—How to Act Safely** (about 30 frames). "Never Be Afraid of Anything"—mainly against fear of dark or night. "Keep to the Right"—reasons for keeping to right when walking or riding, results of keeping to left. "Remember Your Name and Address"—to whom one goes for help when

lost. "When You're Watching a Parade"—need to hold mother's hand, what to do if lost.

**Part III—Goofy Things to Do** (52 frames). "A Goof Plays on the Roof"—dangers of playing on roof, safe places to play. "Sticks and Stones and Bones"—results of throwing objects at animals or children. "Striking Things"—results of hitting your dog, of hitting objects you don't like, need to learn to strike matches properly. "Popguns and Rifles"—incident of boy losing an eye playing with gun, warning not to play with father's rifle.

**Part IV—How to Be Careful at Home** (34 frames). "Pins and Needles, Needles and Pins"—proper use of needles, pins, scissors, and knives. "Leaning Out of Windows"—need to hold on to something secure. "Hot and Cold Water"—importance of looking before turning on the faucet.

**Part V—How to Be Careful in Our Neighborhood** (46 frames). "Automobile Has Two Big Eyes" cautions about playing near cars. "Talking to the Driver"—results of calling driver's attention away from driving of car. "Stay Away from the Railroad Tracks." "Heroes of Peace"—people who help the community, police, fireman, postman, and man who cleans the streets and proper attitude toward such workers.

**The Use of Fire Extinguishers** (Castle, made for U. S. Navy, No. SN-734, si, 54 frames). Describes different methods used in handling different types of fires. Demonstrates proper use of water, soda acid, vaporizing fluid, drying compound, foam, and carbon dioxide extinguishers. Refers to the five types of extinguishers found in Naval stations, but is a good general film for all safety classes, particularly for industrial safety.

For supplementary, illustrative, and related materials on the lower elementary or primary level, see also the following:

Jimmy Rabbit Series

Safety at Play

Primary and Primary Stories Series

Safety First

Protecting Farm Man Power



# Schools and Teacher Training

This section of the book lists only those filmstrips which include material pertaining directly either to schools or to teacher training. It is obvious that the entire book is suitable for reference purposes in teacher training institutions. Furthermore, instructors in such institutions will naturally wish to use filmstrips



From filmstrip "Centralized School." (*American Council on Education.*)

suitable to their special fields of instruction. There is no better way to train teachers to use filmstrips effectively than to demonstrate effective filmstrip-utilization techniques in every subject for which adequate filmstrips are now available.

The materials grouped together under this heading are a heterogeneous collection touching upon several phases not directly related to each other. There is a great need for materials designed specifically for teacher training. Surprisingly, this basic area has been neglected by those advocating the use of instructional visual aids, although it would seem that a teacher who has gained from such aids during her own training would be readier to utilize them

properly. A beginning is being made to meet this need, as visual materials are in production which are specifically designed for use with Dr. Raleigh Schorling's "Student Teaching."<sup>1</sup> As he points out in that text, future emphasis in the trend of educational progress may be on teacher education, following the earlier emphasis on the Herbartian steps, the cycle plan, the problem method, supervised study, the project method, individualized instruction, the child-centered school, the social studies as the core of the curriculum, and adjustment of personality.

It can be hoped that such a trend will be accompanied by a greater awareness of the importance of mass media in interpreting ideas to children and adults. More particularly, it will be highly desirable if all supplementary aids to teaching receive appropriate attention rather than as at present having the spotlight on the most expensive medium, the motion picture. Still pictures of all sorts, including textbook illustrations, illustrations in magazines and other current literature, both 2-by-2 and  $3\frac{1}{4}$ -by- $4\frac{1}{4}$  slides, along with filmstrips, desperately need the same kind of academic attention for the presentation of 90 per cent of school matter that does not require motion. In fact, the concerns producing instructional materials might profitably devote more attention to the effective distribution of still pictures and the visualization of abstract concepts for static reproduction in contrast to the much greater cost per instructional minute of producing sound motion pictures on topics that do not always require motion. If teachers could acquire a simple rule of thumb for measuring the effectiveness of visual aids in terms, not only of dollar cost, but also of classroom time consumed in presentation, much public money now expended on visual education could be saved. It can be hoped that funds thus saved could be spent to stimulate individual teachers to adapt and develop teaching aids most suited to their own individual instructional problems. If each individual teacher could be allowed a budget and the authority to acquire and/or prepare her own visual aids, utilization could be much more effective than it is when a visual education expert attempts to select materials for an entire school system and urges their use with utilization platitudes. If these ideas could be included in new filmstrips on teacher training, they would at least serve to alert each individual teacher to the great opportunities that lie in the generally untapped resources of picture illustration. Suggestions include a lengthy study method which may intimidate students instead of assisting them unless clarified or modified by instructor. However, this strip may be of interest in teacher training groups to help members to formulate plans for assisting their future students.

**Boys, Girls, and Books** (SVE, si, 48 frames). Importance of good library in

<sup>1</sup> SCHORLING, RALEIGH, "Student Teaching," McGraw-Hill Book Company, Inc., New York, 1940.



modern school; use of its facilities by elementary, junior, and senior high school pupils. Illustrates browsing corners, hobby books, conference rooms, use of books as basis for assembly programs, exhibits, library clubs, Book Week programs, materials available on vocational guidance. Examples of rural, elementary, and teachers' reference libraries; floor plan and use of remodeled classroom library.

Some good material on uses of libraries which may interest librarians and also adult groups such as PTA which are interested in library projects. Pictorial content tends to be static.

**Centralized School** (ACE, No. 18, si, 54 frames, lecture notes). Photographs of equipment, building interiors and exteriors, school activities and classes in a centralized school. Includes information on health services, the school farm, homemaking classes, cafeteria, use of school facilities by adults, and the extracurricular program. Good overview of one of the better centralized schools. Suitable for use in teacher training as supplementary material. May also interest vocational guidance groups if it is pointed out that not all centralized schools are as well equipped as the one shown.

**Effective Study Methods** (Castle, No. FS 1-63, si, 43 frames). Produces by the Army Air Forces for military training classes. Discusses proper study conditions, such as temperature, quiet surroundings, lighting, setting time limit, etc., and study techniques, such as note taking, outlining, planning the method of study, use of references, relating theory to practical experience, understanding relationships.

**Illinois Education Association Series** (Illinois Ed. Assoc., 4 films, si, loan). Although these four filmstrips are concerned with the schools and school problems of one state, teacher training institutions in any state may find them of interest as discussion springboards and as examples of school problems that may be encountered. Individual titles with brief descriptions follow.

**Rural School Opportunities in Illinois** (50 frames, lecture notes). Briefly captioned photographs taken in the rural schools of Illinois, in 1940, to show the state's problem of reorganization of the rural school. Shows various activities and equipment in a well-equipped school and in one-room schools; contrasts in a good and a poor rural school. Statistics on pupil enrollment and cost per pupil. Need for county school study committees. Problem of reorganization, need for transportation to larger centers, and expanding educational opportunities.

**Teacher Personnel Problems in Illinois** (50 frames, mainly charts with much text). Certification in the state of Illinois and discussion of proposed legislation in 1941 on teacher tenure and other problems including minimum wage. May interest teacher groups in other states as example of personnel

problems, methods of handling them by urging improved legislation, and requirements for certification.

**Will He Have a Teacher** (31 frames). Designed specifically for support of the Gateway Amendment in Illinois; discusses wartime teacher shortage problems, financing of the state's schools, cost per elementary pupil, indications of minimum wage levels in several other states. Although this strip will become dated quickly, it may interest teacher training groups as basis for discussion of school status problems and teacher shortages.

**Good Schools for All the Children** (42 frames, no captions, speech notes). Discusses importance of good schools for all children, provisions of state constitution for education, example of inequalities in educational opportunity and school buildings, reasons for such inequalities, proposed methods of equalization, importance of increasing state's Common School Fund.

**Informal Pointers for Teachers Series** (Jam Handy, 9 films, sd, or si, about 30 min each, manual). This series was made in cooperation with the U.S. Navy Aviation Schools and class members shown are usually Navy men. The material is designed for the training of inexperienced teachers or those lacking formalized teacher training, particularly in shop instruction. Applicable to methods classes in teacher training institutions. Individual titles with brief descriptions follow.

**The Teacher** (sd or si, 45 frames). Summary of personal qualifications, attributes, and habits. Discussion of good verbal presentation characteristics, disciplinary methods, and responsibility in teaching. Opens with sequence on need of teachers in emergency training program for war efforts.

**Some Principles of Teaching** (si, 56 frames). Suggestions on how the teacher may help learning process and shorten it, including know your subject, arouse interest, keep things simple, presenting one idea at a time, using logical steps. Indicates need for lesson plans, use of simple words with all technical terms defined, having the students "do" to learn. Pictorial material mainly cartoons.

**I Want to Learn** (sd or si, 57 frames). The student's viewpoint on "how he wants to learn." Following points discussed, explained, and illustrated; motivation, understanding what is taught, grooving in the learning, getting satisfaction from learning. Indicates devices for each.

**The Lesson Plan** (sd or si, 59 frames). Discusses place and value of lesson plans and organization of the lesson plan, step by step. The four steps are preparation, presentation, application, checking or drill. Details of the Navy lesson plan and its application to two sample lessons in shopwork. Pictorial material consists mainly of parts of handwritten and printed lesson plans.

**Make Your Chalk Talk** (sd or si, 57 frames). Methods of blackboard drawing and sketching: proper erasing; proper use of chalk and equipment, such as



compasses, rulers, triangles; drawing of circles and straight lines with and without rulers or compass, use of shading and color. Technique of explaining as you draw or write; improving technique by practice. Proper blackboard use for outlines; definition of new terms. Use of blackboard by students.

**Teaching a Vocation** (sd or si, 52 frames). Utilizes natural liking of students to make things. Methods of teaching, both head and hand knowledge required, demonstrating, correcting student's attempts. Stresses need for practice to develop individual skills. Applicable only to vocational classes.

**Shop Teaching** (sd or si, 44 frames). Proper techniques in shop teaching, including preparations of instructor before starting classes, starting the class, checking effectiveness of instruction. Applicable only to vocational or shop instructor training.

**Designing Examinations** (Part I, sd or si, 58 frames). Values of examinations as teaching tools for both instructor and student; qualifications of a good examination. Discussion of essay type examination: advantages and disadvantages, methods of preparing questions, types of questions.

**Designing Examinations** (Part II, sd or si, 59 frames). Methods of preparing questions for various objective-type examinations, including true-false, multiple choice, matching, single answer, and completion. Stresses use of variety, clarity, simplicity, no trick or catch questions.

**Parochial School** (ACE, No. 19, si, 54 frames, lecture notes). Equipment, classes, and various activities at the parish school of the Corpus Christi parish in New York City. Lecture notes give data on organization and administration of parochial schools. Good overview of one of the better parochial schools. Suitable for teacher training as supplementary material. May be used with "Centralized School" and "One Teacher School" described elsewhere in this section. It should be pointed out with all three of these filmstrips, that the school shown is better equipped than most of its type. Discussion of deviations and inequalities might be encouraged as follow-up.

**One Teacher School** (ACE, No. 17, si, 57 frames, lecture notes). Equipment, classes, and various activities of one of the better one-teacher schools. Lecture notes indicate difficulties of rural one-teacher schools and point out that the school shown is better equipped and has a better teacher than most. Suitable for use in teacher training institutions. May be used with "Parochial School" and "Centralized School" described above.

**Visual Aids in Industrial Art Courses** (SVE, si, 160 frames, manual). A "source" strip for teachers of industrial arts, containing separate sequences (as indicated below) to be shown when desired as examples, tests, or problems for class. "Mechanical Drawing"—tools, instruments, examples of methods of lining

paper, spacing legend, alphabet of lines. "Notes on Dimensioning"—type of line, dimension figures, placement of figures. "Types of Drawing"—two frames showing perspectives and views. "Charts, Graphs, and Diagrams"—methods and examples of charts; line, column, and pie graphs, organization diagrams. "Completion problems in Mechanical Drawing"—series of uncaptioned diagrams and drawings to be presented as problems to class. "Problem in Use of T Square and Triangle"—designs for class reproduction. "Types of Homes"—photographs of various architectural types. "Copy to Printed Form"—photographs showing how type is set, composed, proofed, proofread, and setting up job press, locking forms, and running off job. "Learning the Case"—diagrams of type cases for hand setting. "Your Headlamps Speaking"—testing of automobile headlights. "Safety on the Highways"—a guessing game consisting of various situations with questions. "Furniture Types"—examples of various types and styles. Woodworking tools, machines, joints. There are also sequences on other subjects, such as copy for proofreading practice. Series of photographs from various other filmstrips showing random views of building trades, printing, logging, diesel engines, etc. Would require thorough preview by instructor for selection of sequences or single frames applicable to specific courses taught. Pictorial frames in general contain no captions or labels. A few test frames are included in the strip.

## PHYSICAL EDUCATION

**Corrective Gymnastics** (Eye Gate, si, 94 frames). Photographs demonstrating corrective gymnastic instruction: correction of poor posture, round shoulders, spinal curvature; exercises for stretching muscles grown stiff through inactivity; demonstration of simple "stunts" that can be performed by any student after year's training. Good material concerning corrective gymnastics, but clothing and hairdress of students and instructor date the film considerably, reducing its value for class use. However, it may be of interest to teacher training groups.

**Physical Education Series** (SVE, 4 films, si, manual). The material included in this series is suitable for training classes for physical education instruction. The first 2 strips contain much text material in proportion to pictorial frames; the last 2 strips require the information supplied in the manuals, since the material is not fully captioned. Individual titles and brief descriptions appear below.

**Meeting Physical Fitness Needs Through Physical Education Activities** (45 frames). Stresses differences in individual needs and methods for studying individuals to determine needs. Photographs show use of gymnasium apparatus to aid low-fitness individuals; endurance exercises and their uses discussed—running, swimming, boxing, basketball, rhythmic, skiing, and skating dem-



onstrated. Methods of modifying health habits. Use of relaxation programs and mild sports. Team activity and individual competence games for social adjustment.

**Techniques in Administering and Scoring Fitness Tests** (35 frames). Description and procedures in strength test from medical examination to those including grip strength, back lift, leg lift, pull-up, and push-up tests. Methods of scoring indicated. Norm chart explained. Physical Fitness index explained. Shows tests for both boys and girls.

**Posture—Corrective Posture Exercises** (36 frames). Examples of exercises of various types for correction of posture of both boys and girls. Photographs only; no captions.

**Posture—Corrective Exercises for Specific Posture Defects** (34 frames). Different types of exercises for various posture defects of both boys and girls. Photographs only; no captions.

# Science

Science has received a great deal of attention from the commercial producers of visual aids—more attention, in fact, than any other academic subject. Unfortunately, many of the filmstrips on science follow too closely the pattern set in the production of filmstrips on the subject which has been most frequently treated in filmstrips, namely, those on vocational training. That is, many of the science strips emphasize skills, industrial applications, and principles not generally considered important in the presentation of this subject matter in schools and colleges. There are, however, some very worth-while exceptions to this generalization, especially in the biological sciences, and it can be hoped that future filmstrip productions in the field of science will be more effectively integrated into high school and college course materials.

Very few, if any, of the existing science filmstrips are suitable for use on the college level. This factor, in addition to the basic difficulty mentioned above, leaves ample opportunity for new production on specific academic levels in almost all science areas.

One outstanding advantage of the filmstrip method of distributing illustrative material is the virtue of filmstrips as a timesaver when used to reproduce diagrams and other blackboard illustrations used in science. This type of visual material can be projected on the blackboard and traced in chalk, thus saving valuable preparation time and making blackboard diagrams more nearly perfect in less time than would otherwise be possible, particularly in the case of complicated or involved drawings.

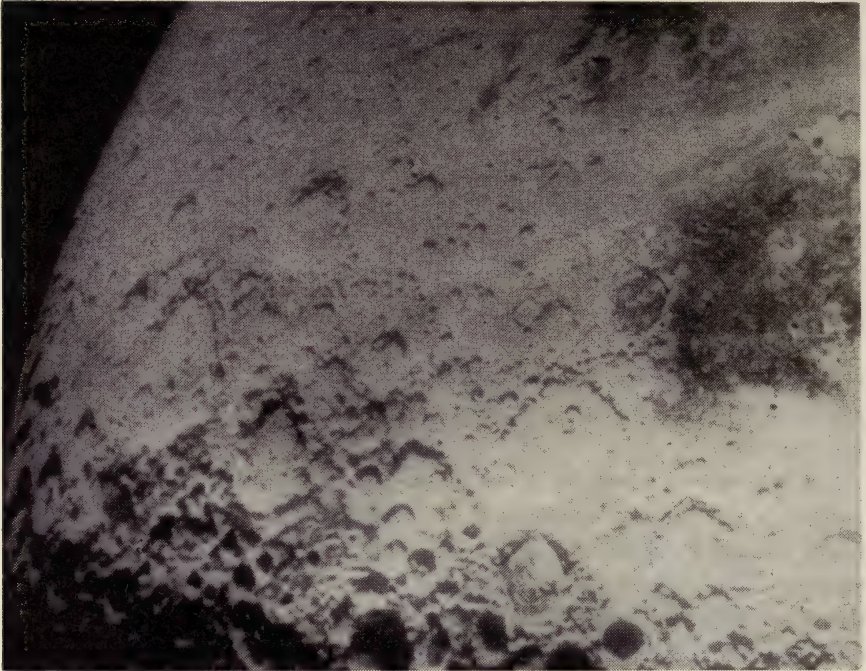
Since many strips are not so well suited for classroom use as one might desire, a great number of titles should be considered as supplementary rather than direct teaching materials. Consequently, the emphasis on utilization in science should be placed on the following points:

1. Stimulating class discussion on points already presented.
2. Providing mechanical assistance in rapid blackboard reproduction.
3. Indicating what to look for in microscopes, demonstrations, or experiments.
4. Assisting in quick review or introduction of a unit.
5. Showing applications of scientific principles.
6. Presenting illustrative material not included in the textbook and not otherwise available.



## ASTRONOMY

The amazing paucity of filmstrips in this field is made even more striking by the excellence of the  $3\frac{1}{4}$ -by- $4\frac{1}{4}$  slides produced a number of years ago by the University of Chicago for the teaching of astronomy. It is hard to believe that astronomy of all the sciences should have such a small selection of filmstrips.



From filmstrip "The Solar System." (*Filmette Co.*)

There is so much available visual material which could be distributed via the filmstrip that it can only be hoped that this situation will soon improve.

Future productions could meet such instructional aims as

1. Show relative size, position, and orbits.
2. Reproduce photographs of astronomical observations of all types.
3. Demonstrate the operation of all important astronomical instruments.
4. Show applications of astronomy to everyday life, such as navigation and the determination of time.

**The Solar System** (Filmette, No. 184, si, 159 frames). Photographs and diagrams presenting first early theories and then modern theories. Includes early

theories of earth and sky—Babylonian and medieval. Sun as worshipped by Egyptians and Incas; sun shown in proportion to earth and other planets; sunspots, origin of spectrum, Fraunhofer lines, various solar eclipses, and phenomena. Earth—path of orbit, visual horizon line, early globes, solidification stages, earthquakes and their results, volcanic activity of Vesuvius and Krakatao, northern lights, formation of tides. Moon—early representations, photographs of surface, Copernicus ring, stages, eclipse. Other planets—each shown in one or two photographs, orbit indicated. Identifying captions in German, French, and English.

Some excellent illustrative material, organized for easy selection of sequences to be shown. Too much material for one class session, except as review, but selected sequences may be shown as required by class needs.

**The Starry Vault** (Filmette, No. 185, si, 112 frames). Photographs and diagrams of fixed stars, cosmic mists, comets, and meteors. Includes early calendar stones, Arabian zodiac, and other early representations. Diagrams and photographs of various constellations and parts of these, the Milky Way, nebulae, shooting stars, spiral nebulae, movement of comets, structure of meteors and meteorites. Identifying captions in French, German, and English.

Too much material for one class session each for review purposes, but well organized for easy selection of sequences to be shown as needed. Some excellent illustrative material.

See also *Historical Astronomy* for supplementary or related material.

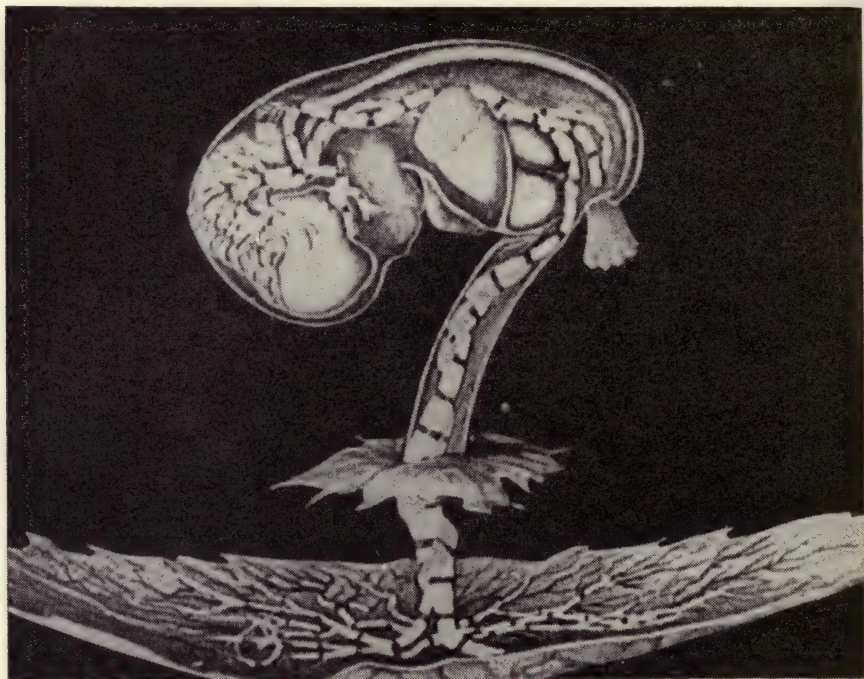
## BIOLOGY

This highly pictorial subject has received considerable attention from the producers of filmstrips although certain areas of the field are as yet comparatively untouched. There has been a tendency to visualize some of the fundamentals, emphasizing such topics as cell structure, reproduction, and the characteristics of various orders. E. T. Smith says in "Exploring Biology,"<sup>1</sup> "Biology is more than the mere accumulated knowledge of individual kinds of plants and animals. The known facts about particular kinds of living things are used to discover the great principles and laws that govern all life. Biology sees life as a whole, as well as living things one by one." The available filmstrips emphasize the "living things one by one" with little attempt to present the underlying principles or laws. Perhaps this problem holds the greatest opportunity for future filmstrip presentation, together with the visualization of relationships between man and the whole organic world.

<sup>1</sup> SMITH, E. T., "Exploring Biology," Harcourt, Brace and Company, New York, 1943.



To date there has been a dearth of filmstrips suitable for college biology classes. However, The Macmillan Company is attacking this problem by producing a series of five strips for use with James W. Mavor's "General Biology."<sup>2</sup> While closely correlated with the Mavor biology text, the series is being designed so that it may be used with other texts also. Phases to be treated in this series include the



From filmstrip "Reproduction in Higher Forms of Life." (Eye Gate House.)

cell, alternation of generations in plants, plant physiology, animal parasites, and life through the ages.

While all the strips listed below pertain to biology, some are more specifically suited for use in botany or zoology classes. This division has not been made since some of the materials (the various filmstrip series, for example) are so organized as to be related to both.

Filmstrips, those available and possible new materials, can be useful in biology, botany, and zoology classes:

1. To show structures, organs, characteristics, and processes that cannot be demonstrated in the laboratory or in nature.

<sup>2</sup> MAVOR, JAMES E., "General Biology," The Macmillan Company, New York, 1941.

2. To provide examples of species desired for illustration but not available as specimens.
3. To illustrate applications of biology (as in agriculture, animal husbandry, and eradication of disease) and to emphasize the importance of this science to modern civilization.
4. To indicate to beginning laboratory classes what to look for in the microscope.

**Animals and Plants as Producers of Lime and Silex** (Filmette, No. 156, si, 41 frames). Photographs of lime structures, skeletons, shells, anchors, plates, etc., and of various marine plants and animals including sea cucumber, St. Louis chalk, Ruegen chalk, Polystone and Haiti slime. Identifying captions in German, French, and English on same frame. Good material on organisms that produce lime; may be useful as illustrative material in senior high school or first-year college biology and zoology.

**Ascent of Man** (Eye Gate, si, 38 frames). Illustrates development of man from ape man of Java, Piltdown man, Neanderthal man, and Cro-Magnon man to present. Indicates development of many different races in different parts of world, showing Negroid, Oriental, Polynesian, Indian, and Eskimo types. Pictorial material suitable for illustration purposes in high school biology. May also interest classes in world history or anthropology as supplementary material.

**Crustacea of the Pacific Ocean** (SVE, 3 films, si, manual). Forty-five species of crustacea with views of each and classifications giving phylum, class, subclass, order, suborder, family, genus, and species. The common name is also given. Each strip shows 15 species. Good illustrative material for high school or college zoology classes. The text material is confined to classifications and the manual provides additional information. Individual parts are listed below with indication of Crustacea covered in each.

**Part I** (49 frames). Narrow-mouthed crabs, short-jawed crabs, southern kelp crab, northern kelp crabs, dwarf crab, sheep crab, moss-covered crab, sharp-nosed crab, rock crabs.

**Part II** (47 frames). Swimming crab, lumpy crab, hairy crab, burrowing crab, commensal crab, striped shore crabs, mud crabs, pelagic crab, fiddler crab.

**Part III** (41 frames). Gooseneck barnacle, mantic shrimp, ghost shrimps, black-tailed shrimps, hermit crabs, sand crabs, thick-clawed crab, flat-topped crab, porcelain crab, beach flea.

**Do You Know Beans?** (Story of Beans) (Eye Gate, si, 81 frames). A study of the growth of beans. Includes the bean seed, parts and their uses; cotyledons; food cells; how seed absorbs water; experiment to explain osmosis; close-ups of shoot growing from seed; experiments on direction of root growth as affected by



centrifugal force and spinning; development of side roots; work of root hairs; plumule. Good material for botany classes or advanced nature study. The several interpolated experiments, as those on root direction and on osmosis, may confuse class if these subjects have not been previously studied, and therefore these sequences may be omitted if desired during the first showing of the strip.

**Earlier and Simpler Forms of Life on Earth** (Eye Gate, si, 88 frames). Part I deals with the formation of the earth's surface from early hot and lifeless earth to wrinkling of surface during cooling and collection of water in depressions. Indicates fossils found in rock strata and their significance. Development of horse as shown by study of fossils. Part II presents various one-celled organisms including amoeba, stentor, and paramecium; explains metabolism; stresses importance of reproduction to existence of race or species. First part more suitable for elementary geology than for biology. Relationship of amoeba and similar forms to earliest forms of life on earth not well established. May interest junior high school classes as supplementary material.

**Eternal Nature and Carnivorous Plants** (Eye Gate, si, 83 frames). "Eternal Nature" (52 frames) presents a simple story of propagation of plants: drawings show growth cycle of a single plant illustrating how flower kingdom propagates its species; parts of flower and their functions given; dispersal of seeds; development of embryo, growth of new plant, and its flowering.

"Carnivorous Plants" (31 frames) shows the pitcher plant as example; its parts, attraction for insects, bristles to prevent escape, insects caught.

The first part of this two-in-one strip provides good material for elementary nature study or first-year botany. The second part presents general information, but does not indicate manner of digestion nor does it give more than one example. **Fundamentals of Biology** (Visual Sciences, 8 films, si). Line drawings and diagrams illustrating the fundamentals of biology, grouped as indicated by the individual titles. Each strip provides much information and might be shown in sequences or single frames utilized as needed by class. It is also suggested that these strips may be useful as drawing guides for rapid reproduction of diagrams on the blackboard in cases where such diagrams or drawings are desired for longer display. Suitable as illustrative material in any biology courses desiring easy access to pictorial material of this nature. Individual titles listed below with brief descriptions.

**Animal Cell Structure, One-celled Animals, Sponges** (No. BI, 37 frames). Typical cell, various types of animal cells, stages in animal mitosis, reduction division of male and female cells; fertilization and mitotic growth; the amoeba—structure, motion, food getting, excretion, reproduction. Types of

Radiolaria and Heliozoa, Foraminifera; whip-bearing parasites of man; life cycle of malaria; Paramecium structure and reproduction; common types of Infusoria; Vorticella—sensitivity and reproduction. Diseases caused by protozoan and plantlike animals. Functions common to all living things; cell or organism diagram; Porifera—section, skeleton, cells, types of spicules, species of sponges, reproduction.

**Coelenterata, Platyhelminthes, Nemathelminthes, Annelida** (No. BII, 36 frames). Coelenterata—structure and definition. Hydra—structure, sting cell, locomotion, regeneration, hermaphroditism. Obelia; Aurelia sea anemone; coral colonies. Platyhelminthes—flat worms, Planaria, life history of liver fluke and tapeworm, other types shown, prevention and cure of flatworm and roundworm infections in man; Annelida—earthworm structure, anatomy; Nereis leech.

**Echinodermata, Mollusca** (No. BIII, 33 frames). Characteristics and diagrams of starfish; echinoderm egg development, regeneration; sea urchin, sand dollar, sea cucumber, sea lily. Characteristics of mollusca; Chiton, land snail, gastropods, clam oyster, squid, octopus, nautilus; statement of economic importance of mollusca.

**Arthropoda** (No. BIV, 33 frames). Diagrams of various crustaceans: Trilobites, crayfish, Daphnia; centipede, millipede, general structure of Insecta, metamorphosis. Diagrams indicating metamorphosis—fishmouths, grasshoppers, bees. Honeybees—types, legs, brood cells, sting, mouth parts, antenna, eyes, breathing system, digestive system, nervous system. Orders of insects. List of human diseases carried by insects. Diagrams of louse, spiders, scorpion, itch mite, horseshoe crab.

**Chordata** (No. BV, 41 frames). Diagrams of intestine-breathing, mantled, head-cord types. Characteristics of Chordata Vertebrata. Pisces: perch as example, internal anatomy; diagram “from fishes to amphibians.” Vertebrata: amphibian frog—internal anatomy, skeleton, development. Prehistoric reptiles. Reptilia: turtle skeleton, snake skeleton, ancestors of modern birds. Aves: pigeon skeleton and anatomy; heads, feet, beaks. Prehistoric mammals. Mammalia; characteristics; egg-laying mammals; Marsupialia; Insectivora; Chiroptera; Rodentia; Cetacea; Carnivora; Ungulata; Primates; cat skeleton and anatomy; vertebrate brain series; foot positions of mammals; fore limbs; complexity of hearts.

**Man and Other Primates** (No. BVI, 38 frames). Characteristics of primates; typical primates; hands, feet, and facial angle of primates; development of erect posture, monocular to binocular vision; comparative brain sizes. Man:



skeleton, skull, vertebral column, structure of bones, tooth structure, muscles, digestive system and absorption, respiration, circulation, heart and blood vessels, excretion, endocrines, brain, response to stimuli, the five senses, the eye, ear, and tongue.

**Thallophyta, Small Bryophyta, and Pteridophyta** (No. BVII, 36 frames). Typical plant cell; types of plant cells; functions of all living things; stages in plant mitosis; reduction division of reproductive cells. Characteristics of Thallophyta; green algae; diatoms and desmids; other types of algae, parasites and saprophytes, slime molds. Classification of bacteria. Disease-producing bacteria, bread mold, mildews, black knot, green mold, yeast, wheat rust, mushroom, other basidia fungi, lichen. Mosslike plant characteristics. Liverwort, peat moss, haircap moss. Fernlike plant characteristics. Club mosses, horsetails, ferns.

**Spermatophyta and General Biology** (No. BVIII, 38 frames). Classes, subclasses, and characteristics of Spermatophyta. Pine—life history, leaf structure, list of other gymnosperms. Monocots and dicots. Roots—normal, adventitious, structure, osmosis. Stems—structure, modified. Leaf—angiosperm leaf structure, veining, shapes, photosynthesis and transpiration. Flowers—structure, pollination. Fruit types: seed dispersal; tropisms, parasites, and saprophytes; insectivorous and epiphytic plants. Biological principles: oxygen cycle, nitrogen cycle, heredity, monohybrids, dihybrids, sex-linked color blindness.

**Honey Bee** (Filmette, No. 155, si, 38 frames). Photographs of queen bee, worker, and drone followed by microphotographs of mouth parts, head, upper jaw, labial palp, proboscis, sting, poison gland, foot. Shows cells of worker, drone, and queen; larva and chrysalis. Identifying captions appear in German, French, and English on same frame. Very good pictorial material for high school or college biology or zoology.

**Human Progress** (Eye Gate si, 49 frames). Examples of early civilizations now gone: paintings of cave men; cliff dwellings; Aztec temple ruins; the Sphinx; ruins of ancient Rome; Stonehenge. Series of frames showing restoration of ancient animal from fossil bones. Man as “mere atom” who has harnessed elements by “power of his brain.” Examples: cities, water power, development of waste lands, transportation, wireless. Suitable for high school classes in biology and social studies; it may be used in conjunction with “Ascent of Man” described above.

**Interdependence of Plant and Animal Life** (Eye Gate, si, 144 frames). Sun as source of all energy; examples of types of energy—fields, forests, workingmen, and animals. Questions for class discussion, such as “What has the sun to do with

the energy of these boys?" Examples of energy as result of burning "fuel." Results of wood burning—chemical constituents of cellulose. Results of oxidizing cellulose. Food as fuel for living things. Oxidation in lungs. Green plants getting energy from sun. Action of chlorophyll. Sources of food raw material. Process of food making by plants. Dependence of animals upon green plants for food—use of oxygen and carbon dioxide by plants and animals. Wastes from animal returning to soil changed by bacteria and used by plants.

Very long for use on one class session and contains a great deal of information. Interdependence not clearly presented until second half of strip. Many chemical formulas. Some of the sequences are very well organized, such as that showing food manufacture and assimilation by plants. Subject matter suitable for first-year biology; selected sections may interest botany classes.

**Microbiology** (No. B-IX, 49 frames). Place of microbiology in biology; early microscopes; work of Pasteur and Koch; size of bacteria; filterable viruses; reproduction by fission; elementary forms of bacteria, combinations of elementary forms, modifications; potential growth rate. Cultures: selection of culture medium; ideal conditions for growth; use of solid media; preparation of culture plates; streaking a plate; isolating single kind of bacteria; use of incubator. Identification and staining methods. Examination of live bacteria. Use of dark-field microscope. Special media. Bacteria molds. Testing germicidal effect of penicillin.

**Prehistoric Animals and Plants** (Filmette, No. 153, si, 69 frames). Photographs and drawings of the following animals, showing skeletons, reproductions, and fossil remains: Trilobites, ammonites, belemnite, mastodons, Plesiosaurus, Ichthyosaurus, crocodile, Dinosauria, Iguanodon, Triceratops, pterodactyls. Drawings showing vegetation of Carboniferous and Tertiary periods, fossils of feather palm, poplar, soapberry, and sequoia. Identifying captions appear in French, German, and English. Identifications of animals and plants are given in Latin or other scientific terminology. Very good illustrative material for senior high school biology. May also interest classes in zoology, geology, and botany.

**Reproduction in Higher Forms of Life** (Eye Gate, si, 142 frames). Opens with long sequence on one-celled animals. Moss: preparation of slide, method of division. Many-celled animals starting as one cell repeatedly dividing—formation of gastrula. More complicated reproduction: fish—egg, yolk, sac, location of ovaries and of testes, egg laying and fertilization, cell division. Reptiles—eggs in sand. Birds—embryo in egg, development, emerging of chick. Mammals—ova passing into womb, fertilization, placenta, food to embryo, development of fetus, osmosis in nourishment, feeding from mammary glands. Very long and much information for use in one class session. First sequences repeat information contained in



"Reproduction of Lower Forms of Life" (described below) but uses different examples. Diagrammatic presentation is clear, well organized, and detailed—particularly sequence on development of embryo.

**Reproduction in Lower Forms of Life** (Eye Gate, si, 113 frames). Division of paramecium: cell division forming spiral; reproduction by conjugation; sexual reproduction; the zygote. Many-celled organisms: Hydra—mouth and tentacles, cell layers, swelling or bud in reproduction, growth, feeding and separation. Sexual reproduction—ovary, testes, zygote, formation of embryo. Plant reproduction—part of flower, fertilization, work of bee, embryo, seed. Very long and much material for one class session, but can be shown in sections if desired. Diagrammatic presentation is clear, well organized, and detailed. Sequence on plant reproduction particularly clear.

**Seeds and Seed Dispersal** (Eye Gate, si, 98 frames). Views of various kinds of seeds, showing their varied shapes. Following seeds shown with method of dispersal indicated: *Nemesia*, willow, coltsfoot, buttercup, lime, hawkweed, globe thistle, dandelion, clematis, horse chestnut. Views of rhododendron flower interior; of globe thistle flowerets; opening of rose, of rhodanthe. Opening and closing of *helichrysum* to protect vital parts of flower. Very long since it contains many examples. Can be shortened if desired by omitting sequences. Organization at times not clear.

**Stages of the Embryonic Growth of Domestic Fowl** (Filmette, No. 154, si, 43 frames). Careful photography showing the following stages in the development of the chicken embryo during brooding: 8 hours, 12 hours, 16 hours, 18 hours, 24 hours, 40 hours, third day, fourth day, fifth day, sixth day, seventh day, eighth day, ninth day, tenth day, eleventh day, twelfth day, fourteenth day, seventeenth and twenty-first days. Each stage identified by brief caption giving hour or day after brooding begins—captions in French, German, and English on same frame. Photographs clearly show characteristics of embryo such as development of feathers. Excellent illustrative material for senior high school or first year college biology or zoology.

**Systematic Botany** (Filmette, 6 films, si). Photographs of examples of plant types indicated by the individual film titles, usually in their natural habitat. Identification appears in brief captions in French, German, and English on same frame and also in correct Latin terminology. This series provides excellent illustrative material for advanced high school botany or for college classes. Individual titles with statement of examples included in each appear below.

**Blossoming Plants** (Part I, No. 171, 94 frames). Glumiflorae, spadiciflorae, Liliflorae, Gynandria, queriflorae, urticiflorae, cactiflorae, polycarpicae, phocadales, cistiflorae, columniferae.

**Blossoming Plants** (Part II, No. 172, 79 frames). Citrus, Saxifragaceae, rosiflorae, Leguminosae, Umbelliferae, bicornes, Primulales, tubiflorae, personatae, nukuliferae, Rubiales, Aggregatae, synandrae.

**Needle Trees** (No. 173, 67 frames). Coniferous trees, both individuals and in forests: firs, spruce, hemlock, shrubby forms of fir, larch, cedars, pines, cypress, juniper, and sequoia. Anomalous growths; mistletoe on pine. Various landscape views showing various kinds of coniferous trees in natural surroundings.

**Flowerless Plants** (Seaweeds, Mosses, Lichens, etc.) (No. 174, 62 frames). Schizomycetes or bacteria; algae, diatoms, Zygomycetes, Zymnema, lichens, ferns, and moss.

**Flowerless Plants** (Mushrooms) (No. 175, 93 frames). Various kinds of mushrooms in natural habitat, with some indications of a few edible types. Includes specimens of *Amanita* species, Agaricaceae, *Boletus*, and *Gasteromycetes*.

**Botanical Geography** (No. 176, 93 frames). General information on world vegetation areas; types of vegetation shown by typical landscapes. Includes cultivated temperate regions, deciduous and coniferous forests, mountain valleys, reed vegetation, low and high marshlands, dunes, timber line; northern highlands, Russian tundra, Mediterranean pines and cypress; eastern Asiatic tea and rice fields, North American coniferous forest and prairies; tropical American dry lands with cacti and yucca; rain forests, monsoon region; tropical African desert, dunes, palm plantation; East African veldt; Australian forests and river valley. May also interest classes in physical geography or principles of geography.

**Systematic Zoology** (Filmette, 11 films, si). Photographs of examples of animals in the groups or classifications indicated by the individual film titles. Identification appears in German, French, and English captions on the same frame. Excellent illustrative material for high school zoology classes and may interest first-year college zoology as review material. Individual titles with brief descriptions appear below.

**Apes, Elephants, Even-hoofed Animals** (No. 160, 90 frames). Apes—gorilla, orangutan, chimpanzee, long-tailed monkey, baboon, mandrill, and howling monkeys. Elephants—African and Indian compared. Cloven-hoofed animals—reindeer, red deer, fallow deer, gazelle, chamois, goat, sheep, buffalo, bison, yak, cow, ox, giraffe, llama, camel, pig, boar, and hippopotamus.

**Uneven-hoofed Animals, Rodents, Beasts of Prey** (No. 161, 95 frames). Ungulates—wild and domestic horses, donkey, mule, zebra, tapir, rhinoceros. Rodents—beaver, squirrel, hamster, porcupine, jerboa, muskrat.



**Batrachia (Amphibia, Fish)** (No. 166, 109 frames). Amphibians—Proteus, iguana, Triton, salamander. Diagrams showing development of frog from spawn to adult with X ray showing structure. Toads and frogs in natural habitat. Fish: development from egg to adult; sturgeon, herring, whiting, pike, eel, cod, sole, flounder, perch, stickleback, mackerel, sea horse, lamprey, ornamental fish, and several deep-sea varieties.

**Articulate Animals (Insecta)** (No. 167, 155 frames). Development of insects, showing larva, shedding, and adults. Orthoptera—walking stick, grasshoppers, locusts, crickets. Neuroptera—lacewing flies, ant lion, beetles (sequence on development of beetles) cockchafer, black fly. Hymenoptera—various wasps, hornets, bees, ants. Diptera—horsefly, drone fly (shows grubs and eyes). Lepidoptera—development of butterfly. Several kinds of butterflies and moths.

**Articulate Animals (Spiders, Crabs, Myriapods)** (No. 168, 82 frames). Examples of Arachnida, Crustacea, and Myriapoda.

**Mollusks, Porcupines, Worms** (No. 169, 86 frames). Mollusca—Gastropoda, Pelecypoda, Cephalopoda. Porcupines. Various types of worms with phylum indicated.

**Mushrooms, Zoophytes, Prehistoric Animals** (No. 170, 105 frames). Specimens of each type. Similar material to "Flowerless Plants—Mushrooms" in series on systematic botany described above and in "Prehistoric Animals and Plants" also described above. Carnivores—bear, raccoon, otter, badger, weasel, ermine, dogs of various breeds, wolf, fox, cheetah, wildcat, lion, tiger, lynx, leopard, puma, hyena, sea lion, walrus, and seal.

**Insectivorous Animals, Toothgrapped Animals, Marsupial Animals, Duckbills** (No. 162, 43 frames). Insectivora—mole, hedgehog, flying fox, bat, shrews. Edentata—sloths, armadillo, ground hog, anteater. Marsupials—kangaroos. Echidna.

**Birds of Prey, Singing Birds** (No. 163, 78 frames). Various birds and their nests: falcon, hawks, vulture, eagle, owls, condor, woodpeckers, parrots, kingfisher, martins, and humming birds; chaffinch, linnet, weaverbird, larks, oriole, swallow, warblers, wrens, wagtails, thrushes, shrike, ravens, rook, magpie.

**Pigeons, Gallinaceous Birds, Coursers, Swimming Birds** (No. 164, 78 frames). Pigeons—wild, wood, etc. Gallinaceous—pheasants, peafowl, wood birds, cassowary, etc. Various wading birds—storks, herons. Swimming birds and their nests—sea gulls, terns, auks, swan, flamingo, various ducks.

**Crawling Animals (Reptiles)** (No. 165, 89 frames). Lizards—horned, ruffled,

Gila monster, blindworm, chameleon. Snakes—vipers, anaconda, python, boa constrictor, cobra, adders, etc. Includes sequence on development of snake showing egg embryo in egg, emergence of snake, X ray of skeletal structure. Turtle—land, box, green. Crocodiles and alligators.

**Vegetal Morphology and Anatomy** (Filmette, 3 films, si). Photographs and diagrams that present excellent illustrative material for advanced high school or first year college botany and biology. The brief captions appear in French, German, and English on the same frame, scientific terminology used where needed. Individual titles with brief descriptions follow.

**Study of Cells and Tissues** (No. 157, 90 frames). The simple cell, nucleus, moss-leaf cells, protoplasm, chromatophores, chloroplasts, indirect and direct division of nucleus, contents of a cell, various stone cells. Histology—types of tissue, cross sections of tissue, stomata, stinging hairs, stellate hairs, scale hairs, excretory hairs, vertical tissue, supporting tissue, vascular tissue, spiral vessels, secretory tissue, and glandular cells.

**Study of Vegetal Organism** (No. 158, 96 frames). Organology—organs of vegetation. Thallus, fungus, lichens, moss, the corm; vegetative cone, internode in stem, various leaf-arrangement types; stem structure and stem types; vascular bundles; leaf types; venation types; root structure and types. Cross sections showing structure of wood.

**Study of Organs—Reproduction** (No. 159, 83 frames). Reproductive organs of plants—zoospores: organs of moss, fern, cluster, compound cluster, ear, compound ear plant types. Diagram of flower with parts indicated; details of reproductive parts. Pollen and pollenization methods. Fruit and seed types. Methods of seed distribution.

See also the sections on Nature Study and on Physiology and Hygiene and the following individual titles for supplementary, illustrative, and related material:

Plants

Story of the Oyster

European Timber Trees

Propagation of Plants

Various Damages Done to Wood and Wood Sicknesses

Anatomy of the Honeybee

Crop Disease and Insect Pests

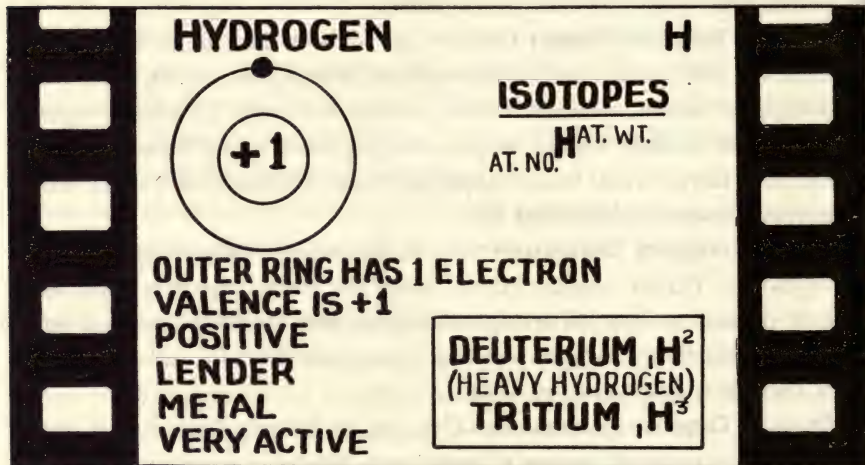
Methods of Selfing and Crossing Corn

Improvement of Plants and Animals through Breeding



## CHEMISTRY

Many chemistry teachers feel that the only visual aid suitable for the teaching of chemistry is the periodic-table chart. Strangely enough, this chart is not analyzed in any currently available filmstrip. This subject has been treated in the chemistry series produced for the Army Education Program, but unfortunately these strips are not at present available for civilian use.



### FROM C-8

From filmstrip "Principles of Chemistry VIII." (*Visual Sciences.*)

In addition to the treatment of the periodic table in visual aids, there seems to be a real opportunity for filmstrips dealing with the applications of chemistry, particularly in industry, for example, with such topics as the cracking of gasoline and the making of steel. Of course, a large new field for teaching aids is being opened up by the inclusion of units on synthetics in chemistry courses.

**Chemistry of Combustion** (Eye Gate, si, 66 frames). Résumé of a number of experiments, including chemical fire of several types; making nitrogen iodide; Grecian fire; explosion of chlorate of potash upon drying after being moistened with solution; igniting of metal sodium placed on wet cotton pad; amalgam formed by sodium dropped into mercury; potassium igniting upon contact with water; "serpents" formed by ammonium sulphocyanide added to solution of mercury salt; burning nails in jet of oxygen with coal gas. Merely photographs of a number of chemical experiments, some of which might be performed in school laboratories. No conclusions are indicated, nor is the significance of any experi-

ment explained. Might be of interest as review of experiments demonstrated in the classroom.

**Introduction to Inorganic Chemistry** (Filmette, si, 98 frames). Photographs and diagrams of fundamentals, particularly of various laboratory apparatus and its use in experiments. Includes distillation methods, combustion of oxygen, bunsen burner, Dewar vessel, decomposition of steam and water, production of hydrogen empirical and structural formula, migration of ions, electrolysis, ozone tube, production of muriatic acid, production of hydrofluoric acid, experiment with candle-flame parts, combustion, Davy safety lamp, periodic system, various systems of crystals. Identifying captions in German, French, and English. Too much material for one class session, except for general review. Strip provides some excellent illustrative material and may be shown in sequences as needed.

**Principles of Chemistry** (Visual Sciences, 8 filmstrips, si, 45-50 frames each). Line drawings and diagrams of experiments, commercial applications and processes, theories, and other fundamental principles are presented in each of these filmstrips. Individual strips may be shown in entirety for introductory or review purposes; selected sequences or single frames may be used as illustrative material or for rapid blackboard reproduction. The films contain much text, including lengthy definitions and lists, making this series similar to an illustrated lecture. Individual strips are listed below with brief indication of subject matter content.

**Principles of Chemistry** (Part I, No. C-1). Historical data, physical and chemical changes, oxidation, combustion, allotropism, etc.

**Principles of Chemistry** (Part II, No. C-2). Electrolysis, reduction, syntheses, distillation, crystallization, multiple proportions, molecules, etc.

**Principles of Chemistry** (Part III, No. C-3). Metals, nonmetals, halogens, flame tests, etc.

**Principles of Chemistry** (Part IV, No. C-4). Nomenclature, formula writing, type problems, sulphur and S compounds.

**Principles of Chemistry** (Part V, No. C-5). Ionization, neutralization, types of reactions, nitrogen cycle,  $\text{HNO}_2$ , nitrification, etc.

**Principles of Chemistry** (Part VI, No. C-6). Carbon and C compounds, calcium and Ca compounds, gaseous fuels, liquid fuels, etc.

**Principles of Chemistry** (Part VII, No. C-7). Metallurgy; types of ores and metals, general methods of reduction and processing, common alloys, special steels, properties, etc. Organic chemistry fundamentals.

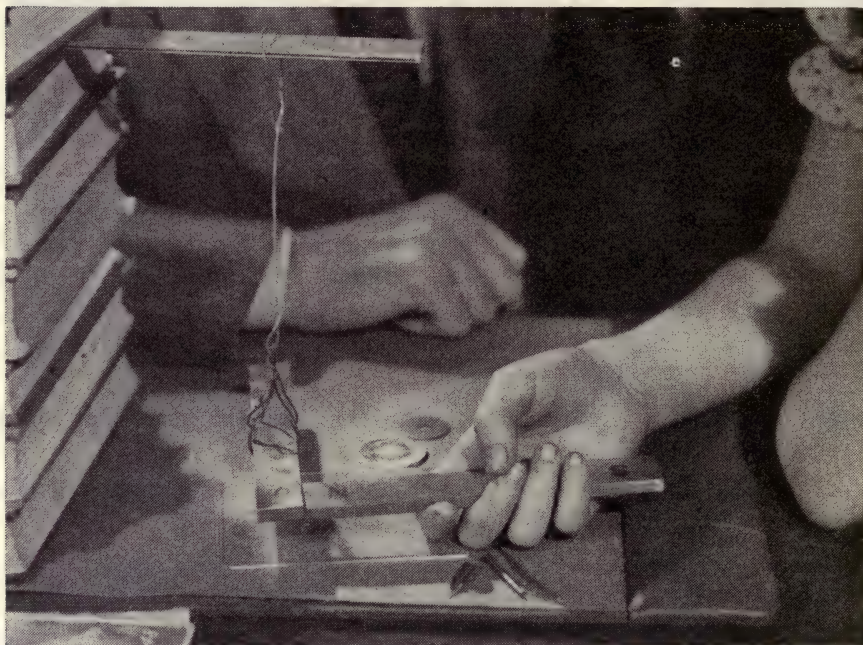
**Principles of Chemistry** (Part VIII, No. C-8). Electron theory, periodic table, various atomic theories, chemical behavior in accordance with electron theory.



See also Chemical and Mechanical Experiments, the Foundations of Chemistry Series, and Testing the Drinking Driver for supplementary or related materials.

## GENERAL SCIENCE

The general science teacher is faced with a more complicated problem of selection of visual aids than almost any other instructor. There are several reasons for this dilemma. One, there is already available in most schools a considerable amount of demonstration equipment to show simple scientific principles and



From filmstrip "Magnets." (Young America Films, Inc.)

applications. Furthermore, the urgency of nuclear physics forces the contraction of other sections of the general science course if the course of study is to be kept in tune with the headlines and student interest. This continuing realignment of subject matter does not allow the teacher much opportunity for painstaking analysis of the large number of visual materials that touch upon this field. An added problem is the need for a large proportion of class time for discussion. This need, in fact, favors filmstrips over motion pictures and demonstration experiments, because filmstrips, if properly used, can be incorporated into active student participation.

It may be that few of the following materials will be considered worth the use of class demonstration time, but surely many of them can be effectively integrated into reviews or discussion periods. Unfortunately, the majority of the strips that are included in this section were not specifically produced for the teaching of general science and consequently they should be carefully analyzed in the light of the needs of the individual course.

A new filmstrip program is now underway which will provide not only strips designed specifically for the teaching of elementary science, but strips designed for use with specific texts. Row, Peterson and Company have just begun production of filmstrips correlated with their Basic Science Education Series of Unitexts.<sup>1</sup> While these films will be closely correlated with the unitexts for which each is produced, it is expected that they can be used in other elementary science programs also. If the entire series follows the pattern of the first strip "Simple Machines" (described below) the films will present one science topic organized in short sequences suitable for one class session, with the whole strip presenting the entire topic in such a manner that it may be used effectively for review. The plans include the treatment of such subjects as seeds, trees, air, forms of precipitation, magnets, and living things for the intermediate grades, and soil, earth's changing surface, science and superstition, light, and life through the ages for junior high schools.

The general science teacher may find filmstrips of assistance in

1. Showing applications, phenomena, and similar material, particularly when these cannot be easily demonstrated.
2. Presenting a fund of illustrative material to aid in broadening pupil experience and knowledge of the importance of the sciences in modern everyday life.
3. Providing an efficient means for introduction of new ideas not in currently used textbooks.

**Air Pressure in Which We Live and Peculiar Properties of the Air** (Eye Gate, si, 38 frames). This strip presents two subjects in one. "Air Pressure in Which We Live" (26 frames) reviews two simple experiments: formation of vacuum in can and effect on sides of can; vacuum forcing shelled hard-boiled egg into flask. "Peculiar Properties of the Air" (12 frames) presents several simple demonstrations: air pressure raising weight; effect on sheet-rubber jar covers; effect of compressed air on rubber tube; liquid air freezing a flower. Experiments that are simple enough to be performed in any laboratory or classroom, but may be useful as a review of demonstrations.

<sup>2</sup> PARKER, BERTHA MORRIS, and GLENN BLOUGH, "Basic Science Education Series," Row, Peterson and Company, Evanston, Ill., 1941-1947.



**All Aboard for the Moon and Astronomer's Workshop** (Eye Gate, si, about 100 frames). This strip presents two subjects in one roll. "All Aboard for the Moon" (79 frames) is the story of a rocket trip to the moon, drawings showing the rocket ship interior and exterior, views of moon during approach. "Astronomer's Workshop" (28 frames) views of instruments at Wesleyan College observatory, photographs of moon, measuring time by passage of stars, chronograph. The first part is purely a fantasy with little value as a teaching device. The second part presents photographs of old equipment, since it was made in the 1920's, and therefore is now outdated in several aspects.

**Beneficent Sun** (SVE, si, 55 frames, manual). Uncaptioned photographs, with information supplied in manual, attempting to show relation of sun to everything we possess and to our everyday life. Views of various landscapes, fields, animals, cities, factories, hydroelectric plants, irrigation, coal, and other everyday items. Manual relates these to light, heat, and energy supplied by the sun, stressing the sun's part in our food, clothing, shelter, heat, light, and power. Not usable without information of type supplied in the manual since the filmstrip itself does not convey the relationships described in the manual. The effects of the sun itself are not visualized—only results are shown, which require explanation.

**Chaos to Cosmos** (Eye Gate, si, 55 frames). Drawings and photographs depicting the formation of the earth. Opens with views of the heavens before earth was formed; trails of star dust drawn toward parent body, swirling into separate masses, formation of bodies around central sphere, cooling. Would require considerable explanation by instructor to be of value to any class.

**Chemical and Mechanical Experiments** (Eye Gate, si, 52 frames). A résumé of various experiments: dissolving copper in nitric acid; producing crystals of copper nitrate; reaction produced by wrapping crystals in tin foil; preparation of Pharoah's serpents; action of nitric acid on metallic mercury and other substances. Experiments shown could be performed in most schools. Could be used as a review of experiments if desired.

**Cloud Formations and Air Masses** (SVE, si, 32 frames, manual). Uncaptioned photographs show various types of clouds and cloud formations; diagram of updrafts and of formation of cumuli; map of prevailing air movements; diagrams of storm tracks on East and West coasts; formation of fog or clouds, movements of air between land masses and ocean bodies; stable and unstable air and stratus due to mixing.

Some good information and diagrams for upper elementary or junior high school classes. However, information of the type supplied in the manual is

required, since the pictorial material in the strip does not convey the complete information.

**Conduction of Heat** (Eye Gate, si, 43 frames). Résumé of various experiments including melting of tin foil in flame, boiling water in tin foil and in paper kettle, transmission of temperature of boiling water to paper. Experiments performed are simple enough to be demonstrated in any school; however, this strip may be useful as a review. Experiments as shown would require additional information from instructor for full clarity.

**The Earth and Its Moon** (Eye Gate, si, 61 frames). Development of the earth's surface—evaporation and condensation in torrential rain of primeval storms, gradual cooling, settling of waters over face of globe, and formation of mountain ranges. Little or no information concerning the moon. Photographic quality lacks clarity of detail. Tends to dramatize particularly the "combat between fire and water."

**Eclipse of the Sun and Comets** (Eye Gate, si, 111 frames). Two subjects in one roll. "Eclipse of the Sun" (60 frames) shows in drawings the following: size of moon, earth, and sun; earth's journey around the sun; diagrams of eclipse; photographs of eclipse; definition of chromosphere and corona. "Comets" (51 frames) shows appearance of several comets, diagram of course of Halley's Comet, formation of tail and its direction. Sequence showing eclipse is very long, but may be shown rapidly since it contains numerous views. The first text frame states "the eclipse of 1923 is the last seen in the United States since 1918 and there won't be another until 1925."

**Thomas Alva Edison** (GE, No. L-27, si, 53 frames, lecture notes, loan). Uncaptioned photographs provide biographical material, views of experiments, devices, and inventions, with major emphasis on the incandescent lamp. The lecture notes provide identification and information. The lecture notes are lengthy but the information is necessary, since the visual material is not self-explanatory. Many static photographs are included, but some good information concerning Edison, his contributions, and inventions.

**Electronics** (SVE, made for RCA, si, 50 frames). A general survey including the following: explanation of electrons and their movement; the Fleming valve, De Forest's grid, effect of positive and negative charges on current flow; examples of numerous uses, such as electronic heat generator, radio, spot gluer, electronic soldering, television, etc., with lists of successful uses in metal and nonmetal fields. Ends with a review. Electronics presented as "an old science with a new dimension."

Organization at times is difficult to follow since theory and uses or applications



are intermingled. The strip deals with both theory and application in a general treatment, covering neither fully.

**Elements of Weather and Atmospheric Circulation** (SVE, si, 28 frames, manual). Uncaptioned photographs and diagrams: vertical cross section of atmosphere; graph showing analysis of temperature, pressure, and density; measurement of air pressure; pressure at various elevations; air-flow tendencies; diurnal temperature variations; condensation cycle; the Beaufort scale; weather-map symbols; radiant energy; planetary wind system; effect of surface conditions on winds; onshore and offshore winds, valley and mountain breezes; eddy winds; updrafts; atmospheric topography and circulatory tendencies; isobaric rotation. Requires information of type supplied in manual to be fully meaningful, since strip contains neither text nor captions. More information than can be readily utilized in one class session (except when used for review purposes), but may be shown in sections.

**Experiments in Light Waves** (Eye Gate, si, 38 frames). Résumé of experiments including reflection by bright surfaces and absorption by dark surfaces, action of radiometer, effect of lenses on light rays, and effect of telephoto and prism lenses. Some clear drawings and diagrams, particularly in sequences dealing with lenses. May be of interest as review or introduction to experiments conducted in the classroom.

**Foundations of Chemistry** (SVE, 10 films, si, 30—60 frames each, manuals). General information, including data on sources and uses, scientists and their contributions, and industrial applications. In most cases, the strips contain no text and few captions; therefore, information of the type supplied by the manuals is required to make the films meaningful. Individual titles are listed below, with descriptions where necessary.

#### **The Atmosphere**

##### **Carbon and Its Oxides**

##### **Chlorine and Its Compounds**

##### **Fire and Fuels**

##### **Compounds of Nitrogen**

##### **Oxygen and Hydrogen**

##### **Sulphur and Its Compounds**

##### **Water**

**Facts and Laws.** General information on the following: chemical changes, weight of matter, water meters and other measuring devices; forms of matter; compounds; the common elements and their symbols; gravity; Boyle's law; Charles's law; kinetic theory of gas; Gay-Lussac's law.

**Laws and Theories.** Diagrams, laboratory experiments, and applications of the following: Boyle's law, Charles's law, Gay-Lussac's law, Dalton's atomic theory, law of multiple proportions, Döbereiner's triads, Newland's octaves, Mendelyeev's periodic law and table, modern periodic table, and the electron theory.

**General Science Series** (Visual Sciences, si, 11 films). Drawings and diagrams illustrating various factors pertinent to the subjects indicated by the individual titles, including principles, laws, measurement, and applications. Each strip contains more material than would ordinarily be covered in one class session. Therefore, it is suggested that the strips be previewed carefully so that selection of sequences or single frames can be made in accordance with class needs. The drawings and diagrams are simple and may be used for reproduction on the blackboard. The subject matter and treatment is suitable for upper elementary or junior high school classes. Individual titles are listed below. Descriptions are not included since the titles are self-explanatory.

**Water** (No. G-1).

**Air** (No. G-2).

**Levers** (No. G-3).

**Inclined Planes—Wedge and Jackscrew** (No. G-4).

**Pulleys, Wheel and Axle** (No. G-5).

**Energy** (No. G-6).

**Fire and Heat** (No. G-7).

**Sound** (No. G-8).

**Light** (No. G-9).

**Magnetism** (No. G-10).

**Current Electricity** (No. G-11).

**Great Scientists** (Physics) (Filmette, No. 181, si, 65 frames). Photographs or portraits of the following scientists with name, dates, and indication of contribution of each to physics: da Vinci, Galileo, von Guericke, Newton, Franklin, Watt, Volta, Herschel, Davy, Ampère, Oerstad, Gauss, Gay-Lussac, Arago, Faraday, Carnot, Maxwell, Mayer, Dove, Weber, von Siemens, Ostewald, Planck, Arrhenius, Nerns, Einstein. Identifying captions appear in French, German, and English. General illustrative material that can be expanded as desired by the instructor. May be of interest particularly as an introduction or as a review.

**Hello Mars!** (Eye Gate, si, 101 frames). Opens with theory of life on Mars. Indications of how the man on Mars might look, what characteristics he might have and why; how man-made signals could reach Mars and how they might



appear to the man on Mars. Last sequence shows Mars and the earth signaling to each other. A fantasy which has little teaching value, and which would require very careful introduction and follow-up by instructor if used.

**Historical Astronomy** (Filmette, No. 183, si, 108 frames). Historical data on early astronomers, instruments, and observatories arranged chronologically with names and dates indicated. Includes, among others, Stonehenge, observatories of Middle Ages; Ptolemy; early world maps; sixteenth-century astronomers and instruments; Copernicus; early sextant; Brahe and his observatory; Galileo; Nuremburg observatory; Kepler, Wallenstein, Hevel, Newton, Herschel, Laplace; Chicago planetarium; Einstein tower; Greenwich and Link observatories; modern instruments. Identifying captions appear in French, German, and English.

Some excellent illustrative material suitable for introduction or review, if used in entirety, or as basis for discussion and amplification if shown in selected sequences.

**How Ice Is Made** (Eye Gate, si, 36 frames). Opens with experiments showing ammonia gas becoming a liquid, expanding into gas again taking heat from water and freezing it. Shows removal of mineral salts gathering in center of ice cake and formation of completed ice; removal from molds and ice formation on pipes in storage room.

Requires additional information from instructor as ice-making process is not fully explained.

**How the Telephone Talks** (Eye Gate, si, 84 frames). Opens with comparison of sound waves with water ripples and diagram of sound waves traveling out from electric bell. Indicates conversion into electric waves by telephone. Includes photographs of various parts of the telephone and some explanation of how the receiver is affected by waves reaching it. Requires some additional explanation by instructor, but diagrams are generally clear and legible. The type of telephone shown is outdated, and one photograph of a woman shows outmoded clothing and hairdress.

**Magnetism** (GE, No. L-108, si, 41 frames, lecture notes provided, loan). Line drawings, diagrams, and photographs dealing with elementary concepts of magnetism and the relationship to electric current. Includes early magnets and uses; methods of suspending the needle of compass; attraction and repulsion; the magnetic field, Coulomb's torsion balance and Coulomb's law; lines of force, the molecular theory, methods of magnetizing, the magnetic column, magnetic induction; applications. No captions or text. The lecture notes are lengthy but the information is required to make the strip meaningful. More information than would ordinarily be covered in one class session (except when used for review), but may be shown in selected sequences if desired. The funda-

mentals of magnetism are covered in simple treatment suitable for upper elementary or junior high school. May interest high school classes as review.

**Magnets** (Young America, si, 46 frames, teacher's guide). Fundamental facts about the nature and behavior of simple magnets through the story of two children preparing for a "magic show" they are giving for their friends. During their search for information they cover lodestone, what type of materials magnets attract, how to make a magnet, principle of polarity, use of magnets, and the magnetic lines of force around a magnet. Father shows children how to magnetize a needle, how bar magnet picks up iron and steel but no copper coins, how free swinging magnet points north and south, attraction and repulsion, finding the north pole of a magnet, iron filing experiment to show lines of force. Ends with picture review. Although designed specifically for use in conjunction with motion picture of the same title, the filmstrip is so organized that it can be used independently. Suitable subject matter and treatment for elementary science.

**Mechanical Movements—Wheels, Gears, Belts, and Pulleys** (Visual Sciences, No. M-1, si, 41 frames). Simple line drawings and diagrams illustrating general principles involved in transmission of various types of motion. Includes examples to prove that all machines may be reduced to combinations of the simple machines; various types of wheels, gears, belts, and pulleys used in changing direction or transmitting motion. The diagrams and drawings are simple and clearly executed. The strip may be shown in entirety (particularly for review or as an introduction) or selected sequences and single frames may be used. It is also suggested that selected frames be utilized for rapid blackboard reproduction, if certain diagrams are desired for longer display.

**Meteorological Instruments, Fronts and Forecasts** (SVE, si, 28 frames, manual). Uncaptioned photographs and diagrams. Part I shows various instruments, manual provides information on uses. Part II includes diagrams of the following: cold front, warm front; squall; vertical section through cold fronts and warm fronts of various types; life history of wave cyclone; warm-front-type occlusion; cold-front-type occlusion; an upper front. Requires information of the types supplied in the manual since the strip contains no captions or text other than labels on the diagrams. The strip contains more information than would ordinarily be covered in one class session (except in review), but selected sequences or single frames can be shown as desired. Some of the diagrams in the second part are particularly well adapted to single-frame study or rapid blackboard reproduction.

**Museum of Technics** (Filmette, si, 2 strips). Various views of the exhibits in the Museum of Technics at Munich. Part I (No. 49, 92 frames) includes physics, chemistry, motors, fashioning of metals; exhibits of working models, original



apparatus used in experiments and discoveries. Part II (No. 50, 67 frames) includes architecture, metallurgy, and miscellaneous developments; indicating history of technical progress in these fields. Identifying captions appear in French, German, and English. Good supplementary material or suitable for use as substitute for a museum visit when a nearby museum of technology is not available. The museum pictured contains many items not on view in museums here, and therefore the strip provides historical information not readily available elsewhere in pictorial form.

**Nature's Jewels (Dewfall)** (Eye Gate, si, 30 frames). Opens with text explanation of formation of dew and frost, followed by experiment with formation of dew on cup of water. Major portion consists of photographs of dew on grass, insects, leaves, etc., microscopic views of dew showing its forms. Some indication of importance of dew and frost as moisture. Main stress is upon the beauty of dew, but provides some elementary general information on dew formation.

**Optical Illusions** (Visual Sciences, si, 34 frames). Opens with definition of illusion, and gives examples of many types of illusions and common illusions appearing in nature. Major portion of strip consists of examples of optical illusions showing effect of design, angles, curves, perspective, and other factors on "what you see." Interesting examples of optical illusions, which may be of interest in general science classes as supplementary material. Art and psychology classes may also find this material of interest.

**Origin of Coal** (Eye Gate, si, 40 frames). Drawings show stages in coal formation beginning with prehistoric swamps and vegetation, formation of peat, application and effect of pressure, etc. Indicates difference between anthracite and bituminous coal. Ends with maps of coal regions of United States. Explanation of coal formation clearly presented. Treatment suitable for upper elementary or junior high school classes. Text material is brief but fully explanatory and the drawings are clear.

**Power of the Clouds** (Eye Gate, si, 50 frames). Story of conversion of moisture into electric power. Opens with explanation of formation of clouds; views of rain storms; water gathering in small streams, which flow into larger ones. Shows water stopped by dams, diverted into turbines, water released, and cycle begins again. Indicates uses of electric power. Related in simple terms suitable for elementary grades. Text and captions are brief, but tend to be poetical in nature instead of merely factual.

**Prehistoric Tar Traps** (Eye Gate, si, 29 frames). The tar pits of California: excavator finding and removing fossils, views indicating that viscosity of tar and high banks made escape difficult for animals trapped. Assembled skeletons of giant ground sloth and of imperial elephant. Mainly views of present appear-

ance of the pits, with only a few indications of the type of material unearthed there and its significance.

**Putting Rivers to Work** (Eye Gate, si, 17 frames). Views of men making observations, such as measuring velocity of river, and of the dam and power plant built. Very elementary and general treatment. Does not indicate significance of observations or of the resulting power plant.

**Radar—Little Sir Echo** (Federalist, si, 104 frames, manual). Divided into five general sequences: (1) beginnings in Britain in 1940, and uses in Pacific 1942-45; (2) history of development from work of Hertz in 1886, through development of magnetron tube, collaboration of Britain and United States, giving the milestones in radar history; (3) production of this weapon—American industry; (4) demonstration of SO system, surface-search type; diagrams showing difference between radar and television; (5) various types of radar used during the war, "Window," summary of probable peacetime uses. A general treatment combining background, uses, and some information on operation. Very long for ordinary classroom uses, but can be shown in sections if desired.

**Record of Speeds** (Visual Sciences, si, 47 frames). Line drawings, with text on the same frame, present a large number of high- and low-speed records. Most of the frames include more than one subject and often draw comparisons. Includes speeds of such things as wirephotos, African talking drums, flying bombs, rocket-powered missiles, sound, planes, helicopter, locomotives, automobiles, steam and sailing vessels, submarines, bullets from different guns, baseball, walkers, motorcycles, bobsleds, swimming, tennis, glaciers, rivers, growth of plants, various animals and birds, insects, fish, and snakes. Some interesting material, which may have some application as supplementary or illustrative material, particularly if shown a few frames at a time. Many of the frames contain two or three drawings and considerable text, reducing legibility.

**Science of Weather Prediction** (Eye Gate, si, 56 frames). Views of various meteorological instruments with some information on what they measure and how; indicates how weather history of a day is kept on one record sheet.

A rather old film with some of the instruments outdated particularly in appearance. Elementary in treatment.

**Simple Machines** (Row, Peterson, si, 67 frames, manual). Although designed specifically for use with Unitexts "Doing Work" and "Machines" of the Basic Science Education series, this strip can be adapted to any elementary science program. The opening sequence introduces the six simple machines and stresses their importance. Following sequences treat each of the simple machines separately, showing each first in simple line diagram and providing a number



of everyday examples of its use. Each example is shown in a photograph and with a superimposed line diagram over the same photograph indicating the position of the machine under consideration. Includes information on how each works, amount of force needed, methods of lessening amount of force needed. Shows some industrial applications also. Ends with a photo quiz: picture of some tool in use, students to identify the simple machine or machines demonstrated.

The strip is well organized for teaching purposes and can be used either a sequence at a time or in entirety. The visual device simplifies understanding and recognition of simple machine applications. The sequence explaining relationship of screw and inclined plane is particularly clear in visualization and explanation. Some of the text frames at the beginning of the strip are long, but in general textual content is brief. Many close-ups are used.

**Splendors of the Sky and Birth of the Earth** (Eye Gate, si, 96 frames). Part I opens with views of observatory and instruments, followed by photographs of various planets, nebulae, comets, star clusters, eclipse, sunspots. Part II indicates formation of earth and effect of its cooling, comparing it with heat of sun and the dead moon. Very general treatment, but first section may be of interest to elementary science classes as it contains some good views.

**Steinmetz, Charles Proteus** (GE, No. L-18, si, 29 frames, lecture notes, loan). The story of Charles Proteus Steinmetz, his discoveries and inventions, and their aid in solution of mathematical and theoretical problems and contribution to electrical progress. Includes discovery of law of hysteresis, mathematical method of handling complex alternating current, textbooks on alternating currents, work with other scientists and electrical engineers, the lightning generator. The lecture notes are lengthy but the information is required, since the pictorial material shows mainly photographs of Steinmetz and his fellow scientists, and the strip contains no text or captions.

**Story of Photography** (Visual Sciences, si, 50 frames). Simple line drawings, with text material on same frame, including information on the following: discoveries in physics and chemistry that made photography possible; Aristotle's theories on optics; Alhazen's lens; Bacon's pinhole camera; other early camera theories; camera obscura; Kepler's studies; early chemical experiments and discoveries; early photographers such as Herschel, Niepce, Morse, Daguerre, Talbot, Reade, Bayard, and the Calotype process. Good general information on development of photography. However, the drawings are very small and the frames contain much text, reducing legibility.

**Studies in Magnetism** (Eye Gate, si, 57 frames). The earth as a magnet; currents of magnetic force emanating from poles. The lodestone. How steel can

be magnetized. Experiment with iron filings to indicate changes in direction of currents caused by magnets. Uses of electromagnet. Very general treatment, with little explanation of principles.

**Test of Construction Material** (Eye Gate, si, 51 frames). Views of testing machine that can apply crushing force up to 200 tons. Operations as following materials are tested: timber, hollow-tile bricks, steel, concrete. Parts of machine and its controls shown. Tension and compressions tests. An example of one type of testing machine that may be of interest as supplementary material. New testing apparatus and techniques have been developed since this strip was made.

**Visiograph General Science** (Chicago Apparatus, 6 films, si, copy of textbook "General Science Made Easy" by Louis T. Masson). This series is based on the textbook by Louis T. Masson, utilizing the line drawings, charts, and diagrams that appear as illustrations in the text. The organization of the strips follows that of the text. The strips, if shown in entirety, can be utilized for review or as introduction to units. Selected sequences or single frames can be shown as desired or used for rapid blackboard reproduction. Many of the illustrations are the same as those appearing in the "Visiograph Physics" series. Individual titles follow, with brief descriptions.

**Our World of Science: Matter: Energy: Air: Sound** (No. GS-1, 38 frames). Charts, diagrams, and drawings of general science in daily life; superstition versus science, the experimental method, environment, changes in environment, destructive forces of nature, inertia, composition of matter, forms of energy, weight of air, atmospheric pressure, aneroid barometer, mercury barometer, man's altitude achievements, air pump, force pump, lift pump, siphon, use of reduced air pressure, breathing process, effect of vacuums on sound, wave motion, echoes, properties of musical notes, laws of vibrating strings, human ear, oxygen, oxidation, kindling temperatures, respiration, ventilation.

**The Work of Water: Heat: Sources and Effects** (No. GS-2, 34 frames). Drawings, charts, and diagrams of the following: electrolysis of water, three forms of water, water cycle, water pressure, soft and hard water, hygrometer, air conditioning, water systems, sewage disposal, water impurities and purification, use of force pump, expansion of matter, differential expansion, heat and temperature, heat content and temperature, expansion of gases, temperature scales—calorie and B.t.u.—transmission of heat, conduction, convection, radiation, conductivity of fluids, convection in liquids, convection in gases, heating systems, radiation, thermos bottle, fire extinguisher.

**Work and Machines: Light: Color** (No. GS-3, 37 frames). Drawings, charts, and diagrams of the following: work formula, horsepower, everyday



uses of machines, what a machine does to work, mechanical advantage, screw and wedge, pulley, three classes of levers, force arm of levers, wheel and axle, luminosity, pinhole camera, shadows, eclipse, light rays absorbed and reflected or transmitted, reflection, refraction, incandescent lamp, intensity, artificial lighting, camera and human eye, water lens, parts of eye, means of proper focusing, optical system, common eye defects and effect of lenses, projection lantern, simple microscope, compound microscope, dispersion of light, selective absorption, selective transmission.

**Magnetism: Electricity: Energy in Industry** (No. GS-4, 40 frames). Charts, diagrams, and drawings of the following: lines of force in magnetic fields, laws of magnetism, theory of magnetism, methods of magnetization, induced magnetism, static charges, electron theory, friction, electric discharges, voltaic cell, units of electricity, dry cell, storage battery, electroplating, cells in series and parallel, resistance, Oerstad's discovery, electromagnet, electric bell, telegraph, sodium-vapor and carbon arc lamps, induced current, alternating-current generator, direct-current generator, paper-clip motor, transformers, telephone, vacuum tube, energy and industry then and now, changes in ore to steel, tempering, shaping of metals, Newcomen engine, steam engine, steam locomotive, four-cycle gasoline engine, water power, power transmission, sun as source of all energy.

**Transportation: The Earth: Weather and Climate** (No. GS-5, 38 frames). Charts, diagrams, and drawings of the following: history of roads, types of bridges, modern motorcar as home on wheels, ships, Archimedes' principle, law of floating bodies, devices for safety at sea, balloons, airplanes, lift; origin of solar energy, sun and earth compared, solar system, stars, light-year, cause of seasons, phases of moon, tides, latitude and longitude, time-keeping devices, time zones, international date line, types of rocks, fossils, composition of earth, causes of volcanoes and earthquakes; weathering and erosion, climate factors, air movements, evaporation, precipitation, weather map, germination of seeds, osmosis, photosynthesis, parts of leaf, parts of flower, seed dispersal.

**Soil: Food: Microorganisms: Health and Healthy Living** (No. GS-6, 31 frames). Charts, drawings, and diagrams of the following: values of soil; cycles in nature; nitrogen and carbon; balanced aquarium; types of fibers; body compared with automobile; nutrients; vitamins; cooking methods; food adulteration; digestive system; the teeth; absorption of food; heart; excretion; nervous system; ductless glands; rules for healthy living; causes of accidents; forms of bacteria; helpful bacteria; preserving milk; preserving foods; defense

against disease; the house fly; mosquito; household pests; health laws; health measures in community.

NOTE: Descriptions of above films list the captions of single-frame drawings, charts, or diagrams in the order in which they appear in the filmstrip.

**Wireless Telephony** (Eye Gate, si, 71 frames). Opens with views of water waves traveling out from center, of sound waves traveling out from electric bell, of electric waves traveling in ether. Compares distances covered. Cartoon showing how electric waves carry sound waves. Views of wireless station; diagrams of sending and receiving apparatus. Views of wireless station and equipment outdated; information is that current in the 1920's. May be of interest as supplementary material dealing with history of wireless.

**X rays** (GE, No. L-114, si, 50 frames, lecture notes, loan). Opens with brief history of the development of the X ray—the discovery, later developments, and modern equipment. Second part deals with modern applications in solving “medical, industrial, and detective mysteries” and includes application in preventive and curative medicine, use of fluoroscope, diagnostic uses, treatment of cancer; industrial application—locating imperfections in metals, inspection of hidden assemblies and of welds, crystal analysis, location of foreign matter. Detection—examination of paintings to detect authenticity, of mummy cases, inspection of packages suspected of containing explosives. Possibilities of the future. Lecture notes are lengthy but information is required, since the filmstrip contains neither text nor captions. Good general summary of X-ray development and uses. Pictorial material in general is good.

See also the sections on Principles of Geography, Physics, Chemistry, Biology, Nature Study, Astronomy, Physiology and Hygiene, Basic Electricity and Engineering, and the following series and individual titles for supplementary, illustrative, and related materials:

Dakota's Bad Lands

Ancient Machines in Use Today

Story of Coal, Part I

Wood Structure

Wood Utilization

Iron and Steel Series

Metals Series

Story of Iron and Steel

Aeroplane and Historical Development

Airships and Historical Development



## History of Transportation and Communication Series

## Transportation Series

## World's Largest Aqueduct

## Air Transportation Series

## Research Engineering and Meteorology and Navigation

## Harnessing the Rivers

## Logic

## Aircraft Mechanics Series

## Flight Instruments

## Forces in Flight

## Lift and Drag

## Plane Performance

## Stability

## Weather

## Air Pilotage

## Stresses in an Airplane

## Aviation Metalsmith's Series

## Properties of Metals

## Aerodynamics

## Pilot Training Series

## Properties of Photographic Lenses

## Inertia

## Proper Care Means Longer Wear

## MATHEMATICS

Although mathematics could not be taught effectively without a blackboard, it has been taught successfully without filmstrips and it seems as though it will continue to be taught without filmstrips and motion pictures for some time to come, except on the primary level. It is possible to introduce visual aids into some mathematics courses, but the results in student understanding hardly seem to justify it. Instructors in more advanced courses rarely, if ever, have considered visual aids helpful in presenting this subject matter.

Perhaps, if strips were produced that demonstrated applications of mathematics in everyday life, these would be helpful. However, such applications are usually so familiar to the class that special demonstrations cannot be worth the cost. Certain advanced applications of calculus could be effectively shown in filmstrips, but here again the number of classes that would use them would hardly

justify production costs. As Professor Bancroft Brown has so aptly stated, "No one, not even the mathematics instructor, has as yet figured out how to visualize an abstraction satisfactorily."

Of the strips listed below there is one application that is demonstrated very effectively, the slide rule. Although these strips were designed to accompany motion pictures, they are valuable in themselves, particularly in classroom situations where the "jumbo" slide rule is not available for demonstration purposes.

The newly produced "Primary Arithmetic" series, released by the Popular Science Publishing Company, effectively introduces the pupil to number facts. Although the use of color is not absolutely essential to present the subject matter, it helps to make the strips attractive to children. The device of having children of the same age as the audience appear in the strips should make these subjects very popular, as well as give the children confidence in their ability to do as well with numbers as the child shown on the screen.

**Geometry Series** (SVE, 9 films, si, 50-75 frames each, manuals). Each of the 9 filmstrips in this series consists of simple line drawings, of the type generally drawn on the blackboard, pertaining to the subject matter indicated in the individual titles. The drawings do not show theorems or construction methods in most cases. Information of the nature of that provided in the accompanying manuals is required to make the strips meaningful, since captions and text frames are not used in the films. The material is of first-year geometry level. The pictorial frames do not add anything to the type of diagrams that the instructor of geometry ordinarily uses during class demonstration or explanation. Titles are listed below.

**Introduction to Plane Geometry** (No. 1).

**Rectilinear Figures—Triangles** (No. 2).

**Rectilinear Figures—Triangles and Parallel Lines** (No. 3).

**Rectilinear Figures—Angles and Triangles** (No. 4).

**Rectilinear Figures—Quadrilaterals and Polygons** (No. 5).

**Rectilinear Figures—Polygons and Locus of a Point** (No. 6).

**The Circle—Chords and Arcs** (No. 7).

**The Circle—Tangents and Secants** (No. 8).

**The Circle—Measurement of Angles** (No. 9).

**Light on Mathematics Kit** (Jam Handy, 4 series, 24 filmstrips, si). The entire kit of 24 filmstrips is designed as a review or refresher course in mathematics; however, the subject matter (as indicated by the individual titles) is suitable for other teaching situations. It is suggested that instructors planning to use these filmstrips preview them thoroughly before class use, since the teaching devices



and approaches to subject matter may not be suitable for their classes, particularly in nonreview situations. Individual titles are listed below with brief descriptions.

**Kit I—Arithmetic (8 filmstrips).**

**Five Keys to Mathematics** (No. 1, 48 frames). Importance of mathematics in everyday and industrial life; amount of mathematics needed. Learning methods to assist student in developing ingenuity in applying mathematics: Use your hands as well as your head; state the problem and the principle in your own words; list jobs that require arithmetical principles; prove the principle several ways; use a reference book. Relation of mathematics to precision and accuracy.

**Addition and Subtraction** (No. 2, 30 frames). Arithmetic as basic to all mathematics. Arithmetic as counting (picket fence as example). Addition and multiplication as counting; subtraction and division as counting backwards. Explanation of the following: units, tens, and thousands; carry-overs; borrowing; use of decimal points; anticipation of results and other checking methods for addition and subtraction. Suggested group of problems for practice.

**Multiplication and Division** (No. 3, 70 frames). Stresses importance of accuracy. Multiplication: reasons for indentation, problems drawn as areas to show 10's, 100's, and units; step-by-step solution of problems. Division: step-by-step solution; handling of decimal points and zeros; treatment of remainders as fractions or decimals. Checking methods. Short cuts—use of factors, problems involving zero at end of number, use of decimal points. Symbols used; terminology.

**Fractions, Decimals, and Percentage** (No. 4, 59 frames). Definitions; uses; examples of when to use fractions and when to use decimals. Conversion of fractions to decimals, decimals to fractions, mixed numbers to improper fractions and improper fractions to mixed numbers. Meaning of decimals as division. Advantages of decimals and fractions; importance of selecting right form. Explanation of percentage; methods of expressing as fraction or decimal; procedure in solving percentage problems. Shows similarities and relationships of fractions, decimals, and percentage.

**Addition and Subtraction of Fractions** (No. 5, 47 frames). Common denominators: compared with whole-number computations, denominator as "size" of part, similar to addition of feet or yards; problems illustrating use of common denominator; finding lcd by factoring. Procedure in addition and subtracting after common denominator has been found. Problems involving mixed numbers solved. Anticipation of answer suggested as check.

**Multiplication and Division of Fractions** (No. 6, 30 frames). Explanation of indicated multiplication and division. Multiplication: use of factor method; procedure shown step by step. Division: reasons for inverting divider; procedure. Problems in multiplication and division of whole numbers, decimals, and mixed fractions by fractions. Use of improper fractions in solution; reduction method. Cancellation procedure in solutions. Summary.

**Square and Cube Root** (No. 7, 52 frames). Explanation of meaning of "squares" and "square root." Square root visualized—square with root indicated as one side of it and 10's, 100's, and units as areas within square. Procedure in extracting square root; problem solved and compared with drawing. Cube root and cubes explained and visualized by similar method to that above, using a cube. Method of extraction of cube root. Visualization of squares or cubes may tend to be confusing if not carefully presented.

**Order of Operations** (No. 8, 46 frames). Practical uses of arithmetical processes. Operations involving choices of basic methods. Methods of planning solution to save unnecessary operations. Order of operations as indicated by conditions of problem to be solved. Series problems—danger points, use of brackets, procedure, and order of operations. Short cuts—combining operations, cancellations.

**Kit II—Geometry** (7 filmstrips).

**Addition and Subtraction in Geometry** (No. 1, 56 frames). Relation of geometry to basic arithmetic. Examples of addition and subtraction used geometrically in measurement, adding and subtracting lines, angles, areas, and volumes. Fundamentals from which theorems are developed. Relationships of lines—moving a line. Relationships within parallelogram and triangle.

**Multiplication and Division in Geometry** (No. 2, 54 frames). Application of arithmetic, illustrating geometric uses of multiplication and division as applied to areas and volumes, to ratios and proportions, to circles, to powers and roots. Methods of computing areas, volumes, finding dimension from given area, problems involving use of powers and roots.

**Angular Measurement** (No. 3, 76 frames). Systems of measurement explained briefly with principles involved in each: degree system; radian system; trigonometric system. Includes use of protractors, compass, inclinometer; explanation of right angles; spherical angle measurement; use of minutes and seconds; changing degrees to radians; measuring revolutions; use of mils; sines and their use; use of trigonometric functions and tables.



**Constructions** (No. 4, 62 frames). Geometric constructions and their relation to problem solution. Reproductive and creative uses of construction principles. Component parts of constructions and methods used. Applications to mechanical drawing and shop layout work. Common theorems and their application to construction.

**Scales and Models** (No. 5, 83 frames). Uses of scales and models; basic ratios and proportions. Applications of geometry. Scale markings and methods of reading. Scale maps and models. Danger points in preparing scales and models. Planning, using, and understanding scales and models.

**Vectors** (No. 6, 55 frames). Vectors as simple means for graphic visualization of the three force properties. Uses of parallelograms; rules of sides and angles; problem showing parallelogram in solving problem, definition of resultant. Analysis of concurrent and resultant forces. Uses of vectors. Methods of computation. Typical problems as examples: three or more forces in series of parallelograms; computation by adding vectors by drawing; computation by trigonometry.

**Trigonometry** (No. 7, 45 frames). Trigonometry an extension of scope of geometry. Development of basic relationships. The general triangle; laws of sines and cosines; table of functions. Typical problems solved as examples.

#### **Kit III—Algebra (6 filmstrips).**

**Positive and Negative Numbers** (No. 1, 60 frames). Definition, examples, applications, and advantages of positive and negative numbers. How they influence each other in the four fundamental processes. Contribution of the negative to mathematical scope. Typical problems solved. Compared with friends and enemies (visualizes "enemies" as Jap soldiers and crooks).

**Ratio and Proportion** (No. 2, 50 frames). Common comparison used in daily life; explanation of ratio and proportion. Order of comparisons, expressing ratios as proportions and the four parts of a proportion. Direct and inverse proportion explained. The "magic three" of proportion in computations. Compound proportion explained. Typical problems set up and solved.

**Exponents and Logarithms** (No. 3, 87 frames). Convenience, use, and meaning of exponents. Explanation and uses of powers and roots; use of radical sign; examples of use in four fundamental processes. Relationship of powers and roots to fractions and factors. Problems involving logarithms solved and explained.

**The Arithmetic of Algebra** (No. 4, 46 frames). Variables and quantities explained with a simple "apple" problem; use of letters to express variables and quantity; meaning of coefficients. The four fundamental arithmetical processes in solving algebraic problems. Factoring defined and methods explained.

**Equations and Formulas** (No. 5, 63 frames). Definition, explanation, and solution of simple equations. Types of equations and methods of solving; manipulation of equations. Formulas as equations; their uses and applications. Transposition.

**Problem Analysis** (No. 6, 45 frames). General approach to problems; organization of facts; analyzing results. Routine and creative problems defined; methods of treating each type. Importance of preparation before solution. Creative problem treatment includes use of graphs as clue; expressing related facts as equations; finding relationships; solving specific equations and resolving problem to one equation, getting additional facts, expressing given facts in new ways.

**Kit IV—Graphs** (3 filmstrips).

**Graph Uses** (No. 1, 53 frames). Examples of uses of graphs in business, industry, and everyday life. Relationship of graphs to formulas and equations. Procedures in developing and reading graphs. Explanation of terms.

**Plotting Graphs** (No. 2, 69 frames). Graphs as method of visualizing equations. Parts of graph, purpose, and relation to equation. Constants and their effect. Linear, simultaneous, and quadratic equations and their solution. Reading graphic solutions. Applications of graphs to aerial mapping and navigation.

**Analytic Geometry** (No. 3, 44 frames). "Typing" equations for plotting. Types of equations producing straight-line graph, circle, ellipse, parabola, hyperbola graphs. Methods of writing equations for easy graphing. Drawing-board methods in graphing. Transforming coordinates.

**Mathematical Instruments** (SVE, 4 filmstrips, si, manuals). Photographs and diagrams showing the types of instruments used for the purposes indicated in the individual titles. Historical data and photographs of early instruments are included. The strips require information of the type supplied in the manuals to be meaningful, since no captions or text frames are used in the films. The pictorial frames show instruments, some instruments in use, a few cross sections and diagrams of instruments. Individual titles are listed below with brief descriptions.

**Measurement Instruments—in the Laboratory** (25 frames). Measurement of discrete units: speed indicators, aerometer, test-scoring machine. Measure-



ment of length and angles: external comparator, calipers, micrometers, bevel protractor, vernier scales. Measuring mass and weight: coin scales, modern commercial scales, analytical balances, autogauge for textiles. Measurement of time: early and modern instruments.

**Measurement Instruments—Outside the Laboratory** (34 frames). Types of ancient surveying instruments. Modern plane table and alidade, theodolite, transit—parts, scales, surveying compass. Early drawing instruments. Modern levels. Navigation instruments: early type; modern compass, sounding leads, artificial horizons, course protractor, pelorus. Measurement of air and water currents—directional aerometer. Early and modern telescopes.

**Calculation Instruments—Graphical Methods, Slide Rules, and Solving Equations** (31 frames). Drawing instruments—pens, compass, extensions, proportional dividers, drafting machine, parallel rulers, pantograph, ellipsograph, perspective instrument, trace computer. Nomographs—types of charts used. Instruments for measuring length of curves. Area measurement—planimeters, integrators, integraph, and cinema integraph. Slide-rule types and scales. Thacher's calculating instrument; Paisley calculator. Solving equations—isoraph, differential analyzer, simultaneous calculator, harmonic analyzer.

**Calculating Instruments—Business Machines** (Part I, 25 frames). Early methods: Korean bamboo rods, Greek wax tablet, finger notation, rules of Grenaille, tally sticks, abacus, Napier's rods, knotted cords. Development of adding machines from Pascal's model in 1642 to modern machines.

**Plane Geometry** (Curriculum, 16 films, si, color, teacher's guide). These 16 filmstrips appear to be designed to present direct teaching material on the fundamentals of geometry, geometric vocabulary, and geometric logic. The first strip is an introduction to plane geometry; films No. 2 to 8 inclusive deal with geometric vocabulary; Nos. 9 to 11 inclusive with postulates and locus, film No. 12 with applications of geometry in art, and the last four with geometric logic. In the first 11 filmstrips, the pictorial material consists mainly of geometric figures of line-drawing cartoon examples. Color is used to identify angles or lines that are equal, to show parallelism, to accentuate geometric relationships, and to call attention to parts of a figure that are under consideration. The four strips concerning geometric logic use story devices to define and explain deductive, inductive, and indirect reasoning, analysis, and mistakes in thinking. A number of problems and questions are included in most of the strips for student solution. The majority of the films present more information than can be presented satisfactorily in most single class sessions and often the pictorial material is of the type that the instructor could easily place on the blackboard. However, the group concerning logic

provides some good visualization, which would be more difficult to present in blackboard drawings. This same group may also interest other classes in which methods of reasoning are being presented. Individual titles with descriptions follow:

**Introduction to Plane Geometry** (No. G-1, 43 frames). Defines geometry, point, line, and plane. Indicates measurements applying to straight lines and to plane figures, with several examples of each. Geometry as study of plane figures: shape, size, and relationship. Each defined; examples given, such as geometric figures, animals, clothing of same shape but different sizes, relationships compared with relationships of different people to a boy. Relationships of lines to each other, to circle. Importance of starting with fundamentals and building on what has been previously learned. Stresses need to trust only logical proof, optical illusions shown; use of logical proof by chemist, aviator, mathematician, etc. Emphasis on geometry as an exact science.

**Vocabulary—Lines and Angles** (Part I, No. G-2, 49 frames). Indicates lines and angles of simplest geometric figures, present in everything around us. Definitions and examples of line's indefinite length, line segment of definite length, mid-point of a line; side, angle, and vertex of angles, determination of size of angles, measurement in degrees. Size of right angle, acute and obtuse angles, reflex angles. Sequence on measurement of angles well visualized.

**Vocabulary—Lines and Angles** (Part II, No. G-3, 50 frames). Summary of the five types of angles. Terms referring to pairs of angles defined and examples given: adjacent, common vertex, common side, complementary, supplementary, vertical angles. Parallel lines—definition, examples in geometric drawings and in common objects. Perpendiculars to parallel lines; transversals—alternate exterior and alternate interior angles formed; corresponding angles.

**Vocabulary—Lines, Relationships** (No. G-4, 23 frames). Drawings and examples of oblique, horizontal, and vertical lines. Definition, examples, and uses of perpendicular lines. Dropping perpendicular from a point to a line. Extending the line so that the perpendicular can be drawn.

**Vocabulary—Triangles** (No. G-5, 39 frames). Definition and composition of triangle. Classification of sides; examples and definitions of each. Classification by angles; examples and definitions. Names of sides of right triangle. Definition and examples of base, medians, bisectors, and altitudes. The three angle bisectors and the three altitudes of any triangle. Exterior angles.

**Vocabulary—Polygons** (No. G-6, 56 frames). Polygons defined. Examples of triangles. Classification by sides; definition and examples. Classification by angles; definition and examples. Perimeters defined; equation for finding



perimeter; sample problems. Equilateral, equiangular, and regular polygons—definitions and examples. Special quadrilaterals—names and characteristics. “Tree” showing relationships of special quadrilaterals.

**Vocabulary—Circles** (Part I, No. G-7, 35 frames). Circle as one of most familiar geometric figures. Merry-go-round used to explain: circumference, center of circle, radius. Diameter defined; examples given. Definitions and examples of semicircles, tangents, secants, chords, point of tangency, arcs—major and minor, segments—major and minor.

**Vocabulary—Circles** (Part II, No. G-8, 23 frames). Cutting piece of pie used to explain central angles and sectors. Sector defined, other examples given. Definition and examples of inscribed angle, inscribed polygon, polygon circumscribed about a circle, concentric circles.

**Postulates—Lines** (No. G-9, 56 frames). Solving geometric problems compared with building of house; postulates as foundation of accepted statements; theorems as upright corner posts; proofs as roof. Postulates concerning lines explained and everyday examples given: line can be extended to any desired length; one and only one straight line can be drawn through two points; straight line is shortest path between two points; two straight lines can intersect at only one point; line segment can have only one mid-point; at a given point on a line one and only one perpendicular can be drawn; shortest distance from a point to a line is the perpendicular distance from the point to the line; through a given point one and only one line can be drawn parallel to a given line.

**Postulates—Triangles and Circles** (No. G-10, 34 frames). Comparison of geometric solution to building of house repeated. Following postulates explained and everyday examples given: corresponding parts of congruent triangles are equal; with a given center and a given radius, one and only one circle can be drawn; radii of equal circles are equal; circles with equal radii are equal in size; a straight line can intersect a circle at not more than two points.

**Locus** (No. G-11, 61 frames). Definition and everyday examples of locus. Examples of paths that are not locus. Different kinds of locus. The five fundamental loci explained and examples given. Applications of loci in designing railroad, charting course of plane, etc.; importance in technical activity involving controlled movement.

**Geometry in Art** (No. G-12, 57 frames). Designed to illustrate use in art of geometric patterns, forms, planes, and symmetry; relationship of geometry to art and architecture. Examples showing applications of simple geometric forms: textile design, patchwork quilts, stained glass, modern cubist and non-

objective painting and sculpture, abstract motion pictures, advertisements, posters and magazine covers, packaging. Geometric forms as basis of architectural design: pyramids, Leaning Tower of Pisa, modern factory, castle, oriental structures. Designs emphasizing geometric planes. Use of symmetry in respect to point, line, or plane: vase, rose window, altar panels, da Vinci's "Last Supper"; use of symmetry in the home. May also interest art classes.

**Logic—Definitions, Keywords** (No. G-13, 42 frames). Example of logic: boy and girl going to the place where biggest and best sodas are available—on the other side of the bridge. Logic compared with the bridge: reasoning defined, definitions as supports for bridge of reasoning. Purpose of definitions. Methods of reaching a definition. Importance of keywords in any definition—some, any, all, none, no. Examples of use of each in definitions.

**Logic—Deductive Reasoning** (No. G-14, 24 frames). Example of boy and girl going across bridge for soda repeated briefly. Comparison of reasoning and definitions to bridge reviewed. Deductive reasoning explained in terms of bridge—passing from what we know to what we want to know. Elements compared with parts of bridge, defined and shown in examples. Examples include (1) deciding whether triangles are congruent, and (2) John as member of football team is excused from gym since all members of team are excused.

**Logic—Induction** (No. G-15, 46 frames). Soda date and bridge analogy reviewed briefly. Inductive reasoning defined and compared with the bridge. Uses in geometry indicated and examples given. Use by botanist, chemist, doctor. Analysis defined, use in geometric problems indicated, and everyday school example given. Indirect reasoning defined; use in solving geometric problems; use by detectives and mechanics.

**Logic—Mistakes in Thinking** (No. G-16, 33 frames). Review of soda date and bridge analogy. Bridge presented as most direct and logical way of reaching conclusion. Short cuts and their failure compared with trying to pole-vault the river instead of using the bridge. Following types of errors explained, defined, and examples given: hasty generalizations; prejudiced conclusions; *non sequitur*. Warning against short cuts stressed.

**Primary Arithmetic** (Popular Science, 6 filmstrips, si, color, teacher's guide). This recently released series provides excellent material for the development of number interest and the introduction of number concepts from nonreading class work to third-grade groups. Besides presenting clear and simple explanations of the number facts considered, each strip provides for interesting and meaningful follow-up activities. The devices used in the strips to explain the number facts are such that similar activities can be a part of later classwork, carrying over the spon-



taneous attention gained from the filmstrip into drill or practice. The concepts presented are well motivated and the use of children in the strip as demonstrators should assist in developing pupil confidence in their own abilities. The series utilizes stories, objects, geometric forms, and cards arranged in groups in the explanations and visualization of number facts. Considerable material for class participation and suggestions for further activity are included. Individual titles with brief descriptions follow:

**What Numbers Mean** (37 frames, no text other than the names of the numbers). Each number from 1 to 10 is shown in geometric forms, and in pictures of objects such as toy animals, cars, and airplanes. The pictures carry also the number figure and word. The second part includes a number of frames for identification and matching drill: rows of objects to be matched with appropriate number words and figures; rows of geometric forms to be matched with words and figures; words and figures to be matched. For use with nonreading classes, teacher to supply comments as frames are shown.

**Zero a Place Holder** (43 frames). Opens with sequence showing how 10 pennies equal 1 dime. Cards are then stacked into piles of ten each to illustrate 10 and 20. A box with two holders, marked "tens" and "ones," used to illustrate the tens from 10 to 90—bundles of 10 cards each placed in "tens" holder, nothing in "ones" holder. Further illustrated with perforated board, one side marked "tens" and the other "ones," and by bead-counting board. For nonreading groups.

**A Number Family in Addition** (37 frames). Birthday party with 7 children present used to illustrate addition facts in the "7" family. Addition of 3 and 4 and of 4 and 3 explained with yellow and blue balloons; 1 and 6, 6 and 1, 2 and 5, 5 and 2 with yellow and green hats. The plus sign is introduced; questions included on which numbers in a problem were added and what the answer means. Children at party arrange their chairs in two groups, seeing in how many ways this can be done, class to tell how many chairs are in each group. Indicates and summarizes number facts learned from the pictures. Birthday cake: candles and pieces of cake cut used to illustrate further the same addition facts. Ends with pictures for viewing class to make problems about the following: birds—3 on one wire, 4 on the other; toy rabbits—in groups of 2 and 5, etc. Ends with suggestions for making study cards.

**The Threes** (40 frames). Opens with examples of the use of the number 3: titles of books about the 3 bears, the 3 kittens, the 3 pigs. Betty buys 3 one-cent stamps at school post office: Betty thought "1 and 1 and 1 are 3"—adding, clerk thought "three 1's are 3"—multiplying. Points out that both ways are right, but the clerk's method is quickest. Dominos used to show same fact.

Three 2's shown by adding and multiplying number of wheels and disks. Other facts in multiplication by 3 presented in same manner using various objects. Table of 3's given as  $1 \times 3$ ,  $2 \times 3$ , etc.; children to write the table as  $3 \times 1$ ,  $3 \times 2$ , etc. Ends with several problems for class solution. Reminds children that they can find the answer in two ways, but that multiplying is quicker.

**The Twos in Division** (45 frames). Division of 8 by 2 approached by a mother preparing sandwiches for picnic: makes 8 sandwiches and wraps them 2 in a package; ending with 4 packages; each package shown as made, children to tell how many sandwiches are left unwrapped. Followed by boy pretending that cards are sandwiches, dividing them into groups of 2 each, and girl putting 8 strokes on blackboard in groups of 2. Fact shown as a division problem—how it is written and how it is read. Other divisions by 2 shown with objects and as problems. Method of proving division by subtraction shown. Ends with suggestions for making a table of the two's in division; making study cards. First example explained and shown in detail; other facts presented more briefly, but follow same pattern.

**Compound Subtraction** (36 frames). Third-grade children selling tickets to puppet show have 64 tickets to sell. The tickets shown in stacks of 10 each with 4 left over. Each of the 28 class members takes one ticket; problem—"How many do Ted and Peggy have left to sell?" Cards used, in stacks of 10 each, arranged in two groups—one of 28 cards, the other of 64 cards. Class asked whether 8 can be subtracted from 4. Stack of 10 cards added to the 4 so that 8 can be subtracted. Same "borrowing" device shown using holder with place for "tens" and place for "ones," moving stack of 10 cards from "tens" container to "ones" container. Other compound subtraction problems suggested. "Borrowing" process well visualized by the card device.

**The Slide Rule** (Castle, made by USOE, 2 films, si, manuals). Designed for use in conjunction with motion pictures of the same titles, but they may be used independently particularly for review purposes or as discussion guides. The subject matter is applicable to high school or college classes. Titles are listed below with brief descriptions.

**The Slide Rule—Multiplication and Division** (No. OE 179). Photographs and drawings with questions or problems for class discussion and solution: review of "C" and "D" scales; uses of these scales for multiplication, division, and combinations of these two operations. Reviews parts, principles, and procedures. Practice in reading various scale positions and rule settings.

**The Slide Rule—Percentage, Proportion, Squares and Square Roots** (No. OE 354). Includes questions and problems for class discussion and solu-



tion on use of "C" and "D" scales to calculate proportions and percentages; calculation of squares and square roots; determining placement of decimals.

See also the following series and individual titles for supplementary or related material for vocational school mathematics:

Aircraft Mechanics Series

Geometric Construction, Parts I and II

T-Square and Triangles, Parts I and II

Pilot Training Series

Pilot Problems

Introduction to Machining Series

Measurements and Measuring, Parts I and II

Machine Shop Work Series

Precision Measurement Group

## NATURE STUDY

Here, as in biology, a considerable number of filmstrips are available. And, again, certain phases have received more attention from filmstrip producers than others. Much of the material concerns specific animals, birds, and insects, and a smaller selection deals with plants, with the emphasis on wildlife.

Perhaps it would be desirable to have additional strips showing domestic plants and animals, indicating their relationship to the undomesticated ones. In this group, pets and their proper care might be included profitably for elementary grade classes. Other phases of nature study, such as weather, the sky, and physical features of the earth, might also be subjects for new production.

The major contribution of the filmstrip to nature study probably is the provision of many illustrations of plants and animals that cannot otherwise be seen. In addition, these materials can aid the instructor in

1. Supplementing or preparing for field trips.
2. Showing life histories easily.
3. Expanding the student's acquaintance with natural phenomena and developing an appreciation of nature.
4. Providing material for identification or recognition exercises.

If the nature study class is keeping illustrated notebooks, the filmstrip provides good source material to help the pupils in making their drawings as accurate as possible.

**Advanced Nature Study Series** (SVE, 9 films, si). General nature study material with treatment and vocabulary of upper elementary level. Photographs and

text frames alternate, with considerable text on the text frames reducing legibility. Individual titles with brief descriptions follow.

**Animal Parade from Sea Anemone to Man** (51 frames). Various views of the following animals with brief information on various aspects of the life of



From filmstrip "Structure of Birds," Basic Bird Study Series. (*Jam Handy Organization.*)

each: sea anemone, horsehair snake, starfish, sea urchin, snail, crayfish, slug, hermit crab, millipede, katydid, tree borer, tomato worm, bullfrog, salamander, lizard, racer, turtles, cliff swallows, opossum, bat, mule deer.

**How Insects Get Food** (45 frames). Brief examples of the following insects getting food, with some indications of food eaten: fish moth, termites, butterfly larva, codling-moth larva, corn-ear worm, powder-post beetle, grasshopper, bumblebee, diving beetle, aphids, moths and butterflies, dragonfly, doodlebug, water tiger, praying mantis, scorpion fly. Close-ups of mouth types.

**How Insects Grow Up** (50 frames). Following insects with stages in gradual, incomplete, and complete metamorphosis: grasshopper, black cricket, diving



beetle, milkweed bugs, cicada, stone fly, dragonfly, damsel fly, doodlebug, ladybug, butterflies, silk moths, polyphemus moth, sawfly, yellow jacket, bumblebee, carpenter ant, cane fly, blow fly, tachinid.

**Life of the Horned Lark** (50 frames). Life history including appearance and color markings, location and structure of nests, eggs, protective coloring of bird, baby larks and their growth, male on guard, cowbird eggs in lark nest.

**Life of Swallowtail Butterfly** (41 frames). Life history: description of adult, close-ups of antennae, eyes, and maxillae; location of egg; caterpillar, moulting; Braconid wasp paralyzing caterpillar for food for own young, braconid cocoon, stages; comparison of caterpillar size in growth; osmeteria; stages in spinning of cocoon; adult emerging and drying. (Sequence on braconid occurs in middle of description of butterfly development—may tend to confuse class unless explained prior to showing.)

**Some Desert Animals and How They Live** (50 frames). Following animals shown in natural desert habitat, with some general data on food habits, areas where found, and whether poisonous or not: horned toad, tortoise, chuckwalla, gridiron-tailed lizard, vinegaroon, centipedes, powder-post beetles, horned snake, milk snake, crested lizard, scaly lizard, giant Uta, gnatsnap, kangaroo rat, antelope ground squirrel, grey fox.

**Some Frogs, Toads, and Salamanders and How They Live** (49 frames). Some brief data on eggs, habitat, development, food, or other detail of the following (incomplete data on each, only one or two items covered): Pacific coast newts, tree salamander, slender salamander, yellow-spotted and tiger salamanders, red-legged frog, yellow-legged frog, desert tree toad, California toad, Great Plains toad, Yosemite toad, spade-foot toad.

**Some Lizards, Snakes, and Turtles and How They Live** (50 frames). Some brief data concerning one or two aspects of life of each of the following (such as egg laying, skin shedding, food, habitat, etc.): rubber snake, horned toads, alligator lizard, gopher snake, garter snake, rattlesnake, fence lizard, king snakes, snake, box turtle, chuckwalla.

**How Color Protects Animals** (48 frames). Examples with description of coloration, of protective coloring of various birds and animals. Seasonal changes of coloring as indicated.

**Australian Animals** (Stillm, No. N-39, si, 38 frames). Opens with map of Australia and geologists' theory that it is one of the oldest parts of world, with verification by type of animals found. General information on appearance of the following animals and indications as to which are found only in Australia: kangaroo, koala bear, ostrich, emu, white skatoo, lyrebird, kookaburra, terns, flying fox,

monitor lizard, lace lizard, echidna, platypus, opossum, giant turtles, dugong. Interesting material well presented for upper elementary grades. May also interest geography classes as supplementary material.

**Beaver** (Stillfilm, No. N-23, si, 30 frames). General information about life and habits of beaver including regions where found, scarcity, homes, dams, food, building activities, food pile, danger warnings. Suitable subject matter and treatment for intermediate grades. Text and photographs alternate, but text frames are not too lengthy.

**Big Trees** (Stillfilm, No. N-13, si, 34 frames). General information concerning the sequoias in the Mariposa Grove, including views of famous individual trees. Suitable for use as supplementary material in nature study or geography in elementary grades. Text and photographs alternate but text frames tend to be short.

**Bird Homes** (Stillfilm, 2 parts, si, 30 frames each). Part I (No. N-6). The following birds and their homes with indication of type of materials used: killdeer, snowy plover, towhee, horned lark, marsh swallow, cactus wren, roadrunner, tanager, cliff swallow, bush tit, flycatcher, dusky warbler.

Part II (No. N-7). The following birds and their homes: woodpeckers, band-tailed pigeon, oriole, hummingbird, mockingbird, phainopepla, Cooper's hawk, osprey, raven, red-tailed hawk. Subject matter and treatment suitable for intermediate grades. Shows mainly types of birds found in Pacific coast areas, although some are found elsewhere also.

**Birds of Coronado Island** (Stillfilm, 2 parts, si). Part I (No. N-8, 28 frames). Views of Coronado Island, favorite nesting places for sea birds, views of coast and of sea lion herds. Following birds with some brief data on each: western gull, cormorant, murrelet.

Part II (No. N-9, 32 frames). Brandt cormorants, Farallon cormorants, pelicans, and gulls with some general data on each. Suitable for intermediate grades to provide material illustrating life and appearance of sea birds.

**Budding and Grafting** (Stillfilm, No. N-37, si, 29 frames). Budding and grafting methods by close-up photographs showing procedures. Budding—testing buds, selection of bud, removing bud, placing and securing in place. Grafting—cleft and whip types, placing, support, results one year after grafting. Inarching, root-scion insertion, and results. Vocabulary and treatment suitable for upper elementary and junior high school classes. May also interest agriculture and forestry classes.

**Butterflies** (Stillfilm, No. N-35, si, 30 frames). Life cycle of mourning cloak butterfly given as example. Data on food for caterpillars, types of cocoons. Wing construction. Other adult butterflies shown: painted beauty, gulf fritillary,



monarch, buckeye, and swallowtail—indication of areas where found. Suitable vocabulary and treatment for elementary grades. Sequence showing life cycle well presented.

**Elementary Nature Study Series** (SVE, 9 films, si). This series presents general nature study material with treatment and vocabulary of intermediate grade level. Photographs and text frames alternate, with considerable text on the text frames. Individual titles with brief descriptions follow.

**How Animals Are Protected from Their Enemies** (30 frames). Following animals shown, with method of protection explained in text (methods include running, coloration, freezing, stinking, imitation): rabbit, caterpillar, tarantula, fawn, killdeer, weasel, skunk, ants, darkling beetle, bumblebee, tortoise, lizards, measuring worms, walking stick insect.

**Growing Up of the Toad and the Tree Toad** (20 frames). General information concerning life of toads, including habitat, laying eggs, tadpoles, growth and food of tadpoles, growth into young toads, change in habitat, and food as adult.

**Growing Up of the Monarch Butterfly** (31 frames). The three stages of growth; food of caterpillars; skin shedding; change from caterpillar to pupa and emergence of adult. Life cycle clearly and simply demonstrated.

**Growing Up of the Buck Moth** (20 frames). Life cycle from placement of eggs to emergence of adult; protection of caterpillar from birds. Not as detailed as strip on Monarch butterfly.

**Growing Up of the Texas Nighthawk** (30 frames). Life and growth of nighthawk including habitat, protective coloring, nests, color protection of eggs, reactions of female on nest if approached, appearance of baby bird, food, changes in appearance during growth. Treatment of protective coloration good.

**Growing Up of the Barn Owl** (30 frames). Life of barn owl including habitat, appearance, nests, food, baby owls, feeding baby owls, rate of growth and weight gains, use of beak for protection, use of talons. Considerable stress on rate of weight gains with several progressive views of growing baby owl.

**Some Squirrels and Other Gnawing Animals** (29 frames). The following animals shown with some data on habitat, food habits, coloring, nests, etc.: Douglas squirrel, grey and red squirrels, chipmunks, ground squirrel, picket pin, ground squirrel), pocket gopher, cotton-tailed rabbit, snowshoe rabbit, pack rat, white-footed mouse. Teeth of gnawing animals described briefly.

**Some Spiders and How They Live** (32 frames). General description of spiders. Photographs of the following with some data on types of webs and

homes, regions where found, whether poisonous or not, food habits and protection: tarantula, jumping spider, cobweb spider, bird-dropping spider, grass spider, orb weaver, black widow, banded garden spider, orange garden spider, yellow crab spider, wolf spider.

**How Young Birds Get Food** (31 frames). Photographs of various kinds of young birds and methods by which they get food, showing parents feeding young and indicating type of food.

**Forest Conservation** (Stillfilm, No. N-15, si, 30 frames). Information given in story of Bob and Dorothy on camping trip. Includes views during drive to mountains, lumbering, grazing cattle in forest pastures, deer, the camp, recreation such as fishing; forest fire caused by careless campers, damage done to forest and its wildlife; ranger instructs children in proper campfire building and extinguishing. Indicates values of forests and services to man. Last frame urges care in protection of forests. Interesting, well-organized material suitable for elementary grades. May also interest groups such as Boy Scouts.

**From Bud to Blossom** (Eye Gate, si, 71 frames). Photographs of the unfolding of the blossoms of the following flowers: three-day narcissus, daffodil, anemone, rose, hyacinth, Spanish iris, Phoenician mullein, quince, tulip, apple blossoms, African daisy, pear blossoms, yellow iris. Some very good photographs of flowers and of their unfolding, but no other information. May interest some elementary classes as supplementary or illustrative material.

**Game Birds and Dogs** (Hawley-Lord, si, 45 frames, color). Opening text frames indicate that wild fowl breed and live in uninhabited areas and that they are hunted only in specified hunting seasons; use of hunting dogs. Sequence on game birds: reproductions of paintings with captions identifying fowl shown in natural habitat, some data on food habits, areas where found—including pintails, Canadian geese, brants, mallards, teals, widgeons, shovelers, gadwalls, scaup, grouse, quail, pheasants, partridge, turkeys, and other birds. Sequence on hunting dogs: reproductions of paintings with breeds identified (dogs shown in hunting field), with some data on characteristics and hunting uses—includes cocker spaniel, springer spaniel, pointer, English setter, Chesapeake Bay retriever, Labrador retriever. Paintings show birds and dogs in detail, coloring and markings well defined. Subject matter and treatment suitable for nature study classes; may also interest art classes as supplementary material and clubs or adult groups interested in hunting.

**Glimpses of Saskatchewan Flora** (SVE, si, 41 frames, manual). Opens with location and type of countryside in Saskatchewan. Major portion of strip shows various plants and flowers found there with common and Latin names given. Shows more than 35 specimens, including western red lily, coralroot, white



birch, rose, lungwort, shooting star, coneflower, crocus, anemone, cattail, etc. Captions appear at the side of the frame. Material suitable for upper elementary nature study or for groups interested in plant identification particularly in areas where the same type of flora is found.

**Grasshoppers** (Stillfilm, No. N-21, si, 30 frames). Text and photographs alternate, presenting method of development, explanation of "moult," appearance of young and adults, related insects such as katydid, cave cricket, cicada, and others. Well-organized material suitable for intermediate grades nature study.

**Honeybees** (Stillfilm, No. N-24, si, 28 frames). Text and photographs alternate, presenting wild and man-made homes, appearance and use of honeycomb, swarming, queens, workers, and drones, laying of eggs, types of cells, aid to farmers in pollenization. Suitable treatment for intermediate or upper elementary grades.

**Introduction to Nature Study** (SVE, 2 films, si). These two strips are designed as general introduction to nature study in elementary grades. Both films are general in treatment and contain considerable text material, with some lengthy captions on the same frame as illustrations. Titles with brief descriptions appear below.

**Typical Trees for Many Lands** (30 frames). Importance of trees to man. Major sequence shows photographs of various trees with country where found indicated, including redwoods, bamboo, turpentine trees, live oak, mango, larches, weeping willow, hickory, Douglas firs, cypress, and others. Ends with quotation from Kilmer's "Trees." Some indication of man's use of each type of tree given.

**Bees and Blossoms** (37 frames). Relationship: bees getting food from flowers; flowers getting assistance from bees in pollenization. Parts of flower and their purpose. Drawings showing structure of bees; types of bees, hives, honeycomb, cells, bee food, and the queen bee. More material about life of bee than its fertilization of flower seeds.

**In Zooland** (Stillfilm, No. N-4, si, 30 frames). The story of Bobby who has no pets but has a number of toy animals and asks his father how animals play. Bobby and toy Teddy bear taken to zoo. Film shows animals seen there including bears, lions, rhinoceros, etc. Interesting treatment for lower elementary grades. Number of zoo animals shown is limited.

**Kangaroo Junior Steps Out** (SVE, si, 24 frames). Photographs with brief text frames: map of Australia; adult and baby kangaroos; baby too large for pouch leaves it and is shown watching father and playing; film ends with return to pouch at sign of danger. General views of baby kangaroo taken in zoo setting. May be of interest as supplementary material in lower elementary grades.

**Life History of the Carolina Junco** (SVE, si, 58 frames, manual). Uncaptioned photographs showing general information on life of junco, including appearance, habitat, nest and nest locations, eggs, hatching, development of baby bird, feeding of young. Not usable without information of type supplied in manual, since photographs carry no identifying captions or information. Suitable for use in elementary nature study, particularly in areas where this bird is found.

**Nature Study Illustrated Series** (SVE, 35 films, si, about 50 frames each, manuals). Each strip provides general information concerning the subject indicated by the individual titles, using text frames alternating with photographs. The text frames vary in length from very brief captions to lengthy text, but in general are fairly brief. Although the plants and animals shown are those of the west coast, particularly of California, classes in other areas may find selected strips applicable (such as the first ten). Treatment and subject matter suitable for intermediate and upper elementary study. The strips may also interest clubs learning to identify flowers, trees, birds, or animals. Individual titles are listed below with brief descriptions where required.

**How Some Animals Get Food.** Type of food and method of getting it of animals including various insects, reptiles, birds, and a few small animals.

**How Animals Get Air.** Methods of breathing and breathing apparatus of various fish, shellfish, insects, reptiles, amphibians, and a few mammals.

**How Animals Reproduce Themselves.** General information on reproduction of various insects, birds, and mammals.

**How Animals Protect Themselves.** Protective measures of various animals, including protective coloring, freezing, running, claws or teeth, smell, etc.

**Mammals, the Hairy or Furry Animals.** General information on life of mammals, including hairiness, food habits, appearance, and habitats. Shows several mammals including bats, bears, squirrels, cottontail, elk, and humans.

**Bats.** General information on appearance, food habits, hibernation, usefulness in destruction of mosquitoes.

**Some Nesting Birds.** Various birds with nests and young shown, including cliff swallows, goldfinch, hummingbird, mourning dove, mallard, killdeer, nighthawk, barn owls. Indicates protection of nest and eggs.

**Beaks and Feet of Birds.** Photographs of various birds with information on type and purpose of beak and feet, including such birds as loon, cormorant, owl, hawk, gulls, sparrow, dove, ptarmigan, ducks, vireo, killdeer, woodpecker, and others. More information on beaks than on feet.

**Birds' Nests.** Nests of various birds with data on appearance, construction, materials, and location, including nest of quail, dove, mallard, tern, blackbird, robin, vireo, woodpecker, cliff swallow, barn owl, eagle, and others.



**Lizards, Snakes and Turtles.** Photographs of various lizards, snakes, and turtles with some general information on eggs, eating, etc.

**Frogs, Toads and Salamanders.** Photographs of various specimens with some information on habitat, locomotion, eggs, etc.

**Some Insect Life-histories.** Development and stages of growth of insects such as grasshoppers, cicada, beetles, butterflies, ant lion, and others. Defines nymphs, naiads, metamorphosis, larvae, pupae caterpillars, and maggots.

**Butterflies.** Appearance of monarch caterpillar, pupa and adult. Appearance of adult and habitat of various other butterflies.

**Moths.** Photographs of various adult moths, some of caterpillars, cocoons and pupae. Several types of egg placement and types of pupae suspension.

**Yellow jackets.** General information on life of common and western yellow jackets, including queen, swarming, home construction, combs, cells, eggs, larvae and pupae, adults.

**Spiders.** Views of various adults with general data on appearance and homes; it includes agalena, cobweb, garden, wolf, tarantula, and black widow among others.

**Sea, Beach and Tide Pools.** Indicates types of animals found in these locations with some activities shown. Includes sand crabs, snails, crabs, eels, anemone, mussels, starfish, and others.

**Spring Wild Flowers of the Open Field (Western).** Various west coast flowers shown, individually and in masses, including such flowers as grassnut, coast iris, sheep sorrel, red maids, California poppy, meadow foam, buckthorn, evening snow, and others.

**Spring Wild Flowers of Canyon and Woodlands (Western).** Various west coast flowers shown, individually and in masses, with areas where found indicated, including blue witch, pipstem clematis, checker lily, honeysuckle, larkspur, thimbleberry, trillium, tiger lily, coralroot, wild ginger, morning-glory, and others.

**Summer Wild Flowers (Western).** Photographs of various west coast flowers with indication of areas where found, including soap plant, Brodiaea, Mariposa, larkspur, phacelia, vinegarweed, mustard, gum plant, painted cup, star thistles, and others.

**Trees of Valley and Foothill (Western).** Photographs of various trees, with some close-ups of leaves, cones, or flowers and indication of areas where found. Includes buckeye, black oak, valley oak, live oak, sycamore, madrono, cottonwood, laurel, digger pine, redwood, alders.

**Conifers of the Sierra Nevada Mountains (Western).** Various trees, types of cone, habitat, and general characteristics, including digger pines,

yellow pines, incense cedars, Douglas fir, sequoia, red fir, silver pine, juniper, tamarack, and others. Begins with trees near mountain base and proceeds up to timber line.

**Conifers of the Coastal Range Mountains (Western).** Photographs of trees with data on bark, needles, cones, and areas where found. Includes Santa Lucia fir, Monterey pines, cypress, nutmeg, redwoods, hemlock, various types of pine, fir, and cedar.

**Along a Redwood Trail.** Scenes along a trail through redwood forest showing types of vegetation and landscape. Includes both flowers and trees.

**Along a Sierran Trail.** Scenes along a trail in the Sierra Nevada, California, showing types of trees, plants, and animals.

**Chaparral.** Definition of chaparral and scenes in typical chaparral, with photographs of vegetation with general data on each.

**Some Plants of California Deserts.**

**Ferns and Horsetails.**

**Mushrooms and Toadstools.**

**Rivers of Ice.** Views of glaciers and their effects, showing Nisqually and Emmons glaciers. Includes terminal moraines, rate of movement, appearance, ice caves, cirque, tarns, formation of rivers, etc.

**Nature Pets.** Views of insects, animals, and birds that can be made pets.

**Nature Study in the Schoolroom.** Describes the following: making animal cage; aquarium needs; insect nets and killing bottles; arrangement of insect collections; making smoke prints and spatter prints; birdhouses; mounting wild flowers; feeding tables for birds, etc. May particularly interest teachers of nature study.

**On the Farm with Tom and Susan** (Popular Science, 6 films, si, teacher's guide). Elementary science information through the story of two children, Tom and Susan, who are spending their vacation on their uncle's farm. The first strip introduces the farm and its activities. The last strip reviews the information given in the rest of the series. The intervening four films may be used in any order that is indicated by class needs. The pictorial material consists of photographs with brief superimposed captions. A few short text frames are also included. All the strips provide many questions and suggestions for class participation during the showing. Each film ends with a photo quiz and suggestions for follow-up activities. The story device lends reality to the series, providing an interesting and stimulating motivation and a means for pupil identification with the two children, which should assist in retention of information through a greater feeling of actual experience. Individual titles with brief descriptions follow:



**Visiting the Farm** (41 frames). The two children and their aunt and uncle are introduced. Scenes of the following activities and things to be seen on the farm are shown: feeding pigs; the scarecrow; horses; ducks; feeding the chickens; leading horses into the barn; work in the garden; sheep; cows; gathering eggs; watering the garden; haying; picking corn; cutting grain; milking; wildlife in the farm woodlands; tools and machines; foods raised and consumed on the farm.

**Animals and Their Young** (36 frames). Robin—the nest, egg, care of young. Baby and mother ducks. Butterfly and caterpillar baby. Mother frog—eggs, tadpoles. Mother fish—treatment of young. Babies born alive: kittens, colt, calf. Three things animals need in order to grow—food, water, air.

**Animal Homes** (33 frames). Various bird nests in different locations. The barn; chicken house; rabbit hutch. The woodchuck's home. Snail and turtle carrying their homes with them. Water as a home for frogs and fish.

**How Plants Live and Grow** (34 frames). Opens with activities in preparing a garden—making the soil ready, need of plants for air in the soil, the seeds for planting. Drawings showing parts of lima-bean seed, sprouting and growing of root and of stem. Functions of each part explained. Care of plants; provision for water and sunlight. Plants as animal food. Parts of plants eaten by people.

**Tools and Machines** (42 frames). Opens with Tom and Susan trying to move a box filled with potatoes—use of logs as wheels and of slanting board to get the box on the porch introduce definition of tools. Tools and machines used by uncle and aunt shown, including tractor, lawn mower, pulley, lever, hammer, sewing machine, scissors, egg beater, can opener.

**Science Review** (39 frames). A review of important facts learned from previous strips. Photographs with captions reminding viewers of points made before. Last frame suggests pupils relate what they saw and did if they had ever visited a farm.

**Ornithology Series** (SVE, 7 films, si, manuals). The filmstrips in this series provide uncaptioned photographs, with some line drawings, illustrating the topics indicated by the individual titles. Since the strips contain no captions or text, information of the type supplied by the manuals is required to make them meaningful. The pictorial content of "Structure and Bill" and of "Wings and Feet of Birds" is better than that of the other strips in the series, providing more detail for study. The material is suitable in treatment for upper elementary or junior high school classes. Individual titles are listed below with brief descriptions.

**Birds of Orchard and Woodland** (28 frames). Various types of orchard and woodland birds in natural habitat; some nests also shown.

**Coloration of Birds** (49 frames). Various types of woodland, field, and water birds in natural habitat—both young and adult. Manual provides information on coloration.

**How to Attract Birds** (28 frames). Suggested methods of attracting different types of birds, including feeding boxes, cages, and types of birdhouses. Manual provides additional data.

**Migration of Birds** (52 frames). Various types of birds, summer and winter nests, gathering for migration, birds in migratory flight, maps of migratory routes.

**Structure and Bill** (39 frames). Bird skeleton, drawings of structure and head detail, different bill types followed by photographs of birds having this type of bill. Eleven types given.

**Wings and Feet of Birds** (44 frames). Five types of wings shown in drawings, followed by photographs of birds having the wing type shown; 11 types of feet shown in drawings followed by photographs of birds having the feet types shown.

**Young of Birds** (21 frames). Photographs of the young of various birds, some in newly hatched stage, others more developed.

**The Owl Family** (Stillfilm, No. N-10, si, 28 frames). Text and photographs alternate, telling a story about the barn owl family in Farmer Brown's barn. Information about appearance, food, nest, baby owls, and related birds. Treatment suitable for lower elementary nature study. Vocabulary simple, but considerable text.

**The Plant and Its Parts** (Stillfilm, No. N-29, si, 30 frames). General information about plants, including habitats, comparison with people as to needs, parts of the plant and purpose of each, ferns as example of plant without flowers or seeds. Subject matter and treatment suitable for upper elementary grades. Considerable text.

**Reptiles of North America** (Stillfilm, No. N-19, si, 32 frames). Photographs of various types of reptiles with data concerning appearance, size, habitat, food habits, etc. Includes desert tortoise, Muhlenberg's turtle, alligator, crocodile, various lizards, Gila monster, and several snakes, such as water moccasin, garter, and rattlesnake. General information suitable for intermediate grades. Text frames and photographs alternate, with some of the text frames quite lengthy.

**Rock and Its Uses** (Stillfilm, No. N-30, si, 30 frames). Theory of earth being entirely rock in early stages; crust of earth of many kinds of rock. Minerals,



igneous, sedimentary, and metamorphic rock defined, examples given. Composition of granite, effect of weathering. Pyramids and Sphinx as examples of slight erosion in dry climates. River erosion. Soil as rock product. Use of rock and rock products in building; use of clay. Iron as a rock product.

Well-organized and well-visualized information for elementary science or nature study. Text and photographs alternate, with some lengthy text frame.

**Science Adventures—Basic Bird Study Series** (Jam Handy, 6 films, si, manual). This series provides more than biological or nature study facts, as it includes material for conservation and appreciation of bird life, various theories (which may provide an opportunity for the instructor to explain scientific theory and its purpose and development), and some information on evolution. Each strip consists of three or four lessons with review questions for each lesson. The material includes photographs, some diagrams, and brief superimposed explanatory captions. The captions include some discussion questions to promote class participation, in addition to review questions. It is suggested that the strips be shown one lesson at each showing as needed by the class, using the strips in entirety for review of units. Individual titles are listed below with brief descriptions. NOTE: Other series planned for production in "Science Adventures" include "Our Earth," "The Sky," "Our Health," and "Water Life."

**The Structure of Birds** (55 frames). Introduction—difference of birds from all other animals. Part I, "The Bird's Streamlined Body"—compared with airplane. Purpose and use of tendons, gizzard, skeleton, lightness and strength of bone structure. Part II, "The Body Covering"—aid in streamlining. Structure of feathers; purpose of down and of outer feathers; oil sac; development from scales of reptiles. Part III, "The Wings and Tail"—theory concerning development of wings. Placement of primary feathers, muscles; endurance in flight; examples and uses of tail feathers.

**Adaptations of Birds** (63 frames). Introduction—differences in birds as related to ways of living. Part I, "Different Beaks and Their Uses." Part II, "Different Feet and Their Uses." Part III, "Different Wings and Their Uses." Each lesson describes and illustrates the different types, indicates their uses, and gives examples of birds having beaks, feet, and wings of types shown.

**Birds' Nests** (66 frames). Part I, "Why Birds Build Nests"—reasons for nests, theory of development of nest building. Part II, "Where Birds Build Nests"—various nest locations with reasons for placement selection. Part III—"How Birds Build Nests"—materials, construction, unusual nest types, differences in nests. Part IV, "Finding Birds' Nests"—suggestions on methods of observing bird nests.

**Migration of Birds** (64 frames). Part I, "The Wonder of Migration"—definition of migration, early superstitions, how information was gathered. Part II, "How Different Birds Migrate"—nonmigratory birds; routes of several birds shown, winter and summer locations given. Part III, "Why Birds Migrate"—theories as to reasons for migrations.

**How Birds Serve Men** (65 frames). Part I, "Birds Serve Man by Destroying Insects"—examples of harmful insects and damage done. Insect-eating birds with estimates of number of insects eaten. Part II, "Other Ways in Which Birds Serve You"—includes eating weed seeds, destroying small destructive animals, work as scavengers, providing food and sport, bring joy with song and color. Part III, "Are There Any Really Harmful Birds?"—values of birds of prey, comparison of good and harm done; extinct animals and birds—cautions not to kill any birds without good reason.

**Helping the Birds** (79 frames). Part I, "Why Birds Need Help"—indicates how man has altered birds' natural habitat and destroyed "balance of nature." Part II, "How Can We Help the Birds"—restoration of natural conditions, planting trees, feeding, providing water and birdhouses, controlling unnatural enemies. Part III, "Hints on Birdhouses"—types, construction, size, shape, entrance, table of dimensions for various birds, mounting methods, and location.

**Seashore Animals** (Stillfilm No. N-12, si, 36 frames). Photographs with brief identifying captions, showing plant and animal forms found in Pacific coast areas, including fairy palm, ostrich plume hydroid, sea anemone, jellyfish, moss animal, starfish, sea urchins, barnacles, sand flea, shrimp, sand crab, piddock. Good illustrative material for elementary nature study. Text frames are brief.

**Seed Distribution** (Stillfilm, No. N-28, si, 30 frames). Information on various seed-distribution methods with examples of plants employing each: "airplane seeds," flyaways, tramp seeds, which catch onto clothing or fur, jumpers, carrying by birds, etc. Brief captions contain simple vocabulary, with first few text frames in rhyme. Treatment and subject matter suitable for lower elementary grades.

**Silk Worm** (Stillfilm, No. X-27, si, 29 frames). Life history of the silk worm from egg to emergence of moth. Indicates stage at which silk is made and amount of silk fiber obtained from cocoon. Presents the life history clearly. Suitable treatment and vocabulary for upper elementary grades.

**Termites** (Stillfilm, No. N-34, si, 31 frames). Opens with diagram of typical subterranean termite colony. Description of termites and damage done to boards. Data on workers, soldiers, and productive classes, and on eggs, homes, and



general habits. Considerable text, but material is suitable for elementary grades. **Toads and Frogs** (Stillfilm, No. N-22, si, 30 frames). Story of Jack and the toads and frogs he saw in his garden. General data on appearance, feeding methods and food, help to gardeners, eggs, tadpoles, comparison of various stages of growth. Well-organized material for intermediate grades. Text and photographs alternate, but text frames in general are brief.

**Trees and Their Value** (Stillfilm, No. N-32, si, 28 frames). Opens with quotations from Kilmer's "Trees." Various trees shown with text concerning their shade and beauty. Some indications of use of trees for lumber, in transportation, for wood pulp, varnish, turpentine, and of nuts and fruits. A very general survey of tree use and products; major stress is on beauty of trees. Vocabulary and information of elementary level.

**Tree Surgery** (Stillfilm, No. N-38, si, 32 frames). Photographs of various kinds of tree surgery with lengthy text frames explaining the type of injury or disease and the method used. Treatment and vocabulary of upper elementary level. May interest nature study classes or vocational guidance groups as supplementary material.

**A Visit to the Zoo** (SVE, si, 56 frames, manual). A series of uncaptioned photographs showing some animals as seen at a zoo, with several views of each in different poses and activities. Includes several kinds of bears, lion, tiger, elephants, giraffe, zebra, camel, deer, monkeys, and others. May be of interest in lower elementary grades for illustrative material or for identification of zoo animals, particularly in locations which do not have a zoo which the children can visit.

**Wasps** (Stillfilm, No. N-20, si, 30 frames). General information including nests, feeding of young, type of food, photographs of various kinds of wasps and wasp nests, examples of insects attacked by wasps. Vocabulary of intermediate grades level. May be of interest as supplementary material.

**Weather** (Stillfilm, No. N-26, si, 30 frames). First sequence names and illustrates the primary and intermediary cloud forms. Second sequence gives values of snow and microscopic photographs of flakes. Third indicates formation of dew. Fourth, uses and harmful qualities of winds. Ends with sequence on heat and cold—thermometer use, daily weather map. Vocabulary and treatment suitable for intermediate or upper elementary grades. The material is well organized and clearly presented.

**Wild Animals of U.S.A.** (Stillfilm, 4 films, si, about 30 frames each). Each strip in this series presents general information and photographs concerning one

group of animals. The information includes habitat, food, appearance, specific abilities, and other items. The material and treatment are suitable for elementary grades. Individual titles with brief indication of animals covered by each appear below.

**Wild Animals of U.S.A.** (Part I, No. N-16). The American deer, including Virginia deer, mule deer, black-tailed deer, moose, caribou, and elk.

**Wild Animals of U.S.A.** (Part II, No. N-17). Wolves, coyote, fox, bobcat, badger.

**Wild Animals of U.S.A.** (Part III, No. N-18). Opossum, skunk, squirrels, prairie dogs, porcupine.

**Wild Animals of U.S.A.** (Part IV, No. N-19). Various bears including black, cinnamon, and those at Yellowstone Park. Includes discussion of hibernation.

**Wild Life of Africa** (SVE, si, 63 frames). Photographs of various animals of Africa with some data on food, areas where found, size, etc. Animals include among others lion, giraffe, zebra, elephant, camel, gorilla, crocodiles, gazelle, antelopes, leopard, okapi, hyena, bongo, wild sheep, cobra, whale, gannets, and flamingos. Many lengthy text frames, but a legible type is used. The animals are shown in natural habitat and the photographs provide good illustrative material for elementary grades.

**Wonders of the Skies** (Stillfilm, No. N-27, si, 30 frames). General information, including eclipse of sun; the constellations and planets; surface of moon; meteors, comets; contributions of telescope. Some lengthy text frames. Information is not fully visualized, but strip provides some interesting material for elementary grades nature study.

See also the Biology section and the following individual titles for supplementary, illustrative, and related materials:

Story of Fish

Story of the Oyster

Wood Structure

Story of Silk

Story of Sponges

Soil and Water Conservation by the Beaver

Forest Botany

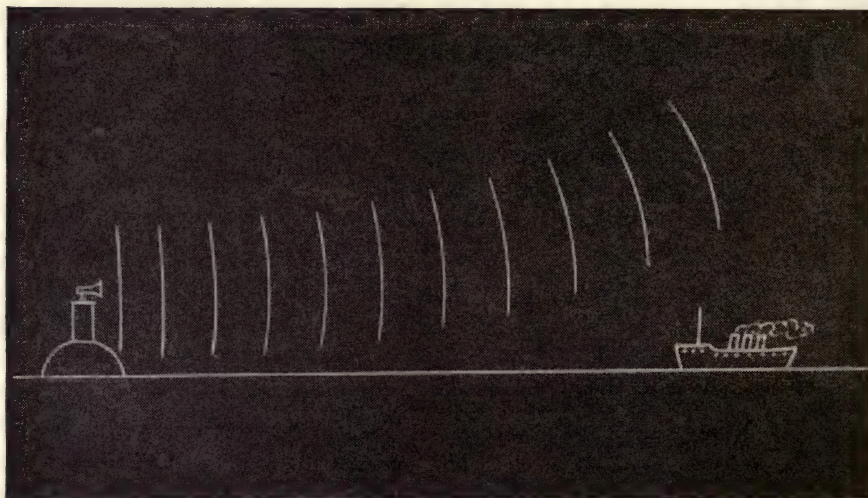
Forestry and Nature Study

Friends of the Trees



## PHYSICS

Theoretically the increasing emphasis in the layman's appreciation of the importance of physics should result in the development of dynamic teaching aids to assist in the presentation of this subject, usually difficult for the average beginning student. Although popular literature has recently devoted more attention to physics than in the past, the introduction of atomic power into our society has not appreciably affected the type of material available for use in



From filmstrip "Sound." (*General Electric Co.*)

this field. One of the reasons probably lies in the fact that the concepts to be presented have not changed and, as was pointed out in the mathematics section, the abstract principles are not easily visualized.

Although some applications are well suited to the filmstrip medium, many of them are also easy to demonstrate or have been made part of standard physics laboratory practice. There is little to be gained from the use of filmstrip which is merely a series of pictures showing examples which can easily be found in everyday life, or are easily available in the classroom. Of course, cutaways and demonstrations of experiments too elaborate for economical reproduction can effectively be presented on filmstrips.

Valuable purposes served by filmstrips in physics include

1. Showing industrial applications.
2. Presenting examples of problems. When such problems are accompanied

by solutions, the presentation of the strip may be stopped after showing the problem while the class works out the solution.

3. Illustrating demonstrations not possible because of limited laboratory equipment.

**Acoustics and Optics** (Filmette, No. 178, si, 99 frames). Photographs and diagrams illustrating fundamentals of sound, acoustics, and optics: the human ear; principles of the phonograph; sound waves formed by vowels, musical instruments; various acoustic patterns; echoes; reflection of waves in air and under water; Behm echo sounding apparatus; tuning forks; Newton's rings; crystals—types, wave surfaces, interference curves, and clouds. Optical illusions. Oscillations—mechanical, vibration types, compulsory oscillation, and oscillatory systems. Identifying captions appear in French, German, and English. Some excellent illustrative material for high school or first-year college physics. Too much material for the ordinary class session, but may be shown in sequences as required by class needs. It is suggested that this strip be previewed carefully by the instructor in order that selection of sequences may be made and organization of information presented be clarified.

**Air Age Physics Series** (Jam Handy, 15 filmstrips, si, 32-84 frames each). The fundamentals of physics as presented in this kit of 15 filmstrips are applied to mechanics, particularly to the airplane. In most cases the subject matter and treatment are applicable to both physics and general science; however, "Force and Velocity as Vectors" is too advanced for most general science courses, as are "Gravitation," "Rotary Motion," and "Centrifugal Force"; "Work" is too elementary for most physics courses. The organization of material, the visualization, and the explanations of principles vary in clarity and effectiveness. The following strips are in general clearly presented with adequate visualization: "Matter," "Units of Measurement," "Force and Velocity as Vectors," "Gravitation," "Rotary Motion," "Centrifugal Force," "Work," "Energy," "Power," "Friction," and "Simple Machines." "Matter" contains some irrelevant material. "Force" as a whole is fairly well organized, but some sequences lack clarity, and would require additional explanation by the instructor. "Uniform Motion" and "Uniformly Accelerated Motion" are not clear in either organization or explanations. In "Newton's Laws of Motion" the illustrations do not contribute fully to clarification and explanation of the laws. Individual titles are listed below with indications of subject matter and additional comments where required.

**Matter** (No. 1, 50 frames). Definition of matter, molecules, atoms, mass or weight. Properties of matter; three physical states of matter; constitution of matter. Similarities of all matter. Importance of state of matter in study of motion.



**Units of Measurement** (No. 2, 47 frames). Motion, force, and energy as measured in terms of mass moved, distance moved, and time. Standard units of measurement for mass, distance, and time in both English and metric systems. Comparison of use of English system for fractional measurement and metric system for decimal measurement. Methods of computing and of changing measurements from one system to the other. Derived units and methods of computing volume, area, and speed. One of the better films in this series.

**Force** (No. 3, 57 frames). Nature of force explained by examples of force, method of measuring force, and formula for force. Units used to express measurements. Definition of acceleration, unit of force, pound of force. Summary of characteristics.

**Force and Velocity as Vectors** (No. 4, 60 frames). Explanation of idea of vector quantities; methods of employing them in calculations. Using force and velocity as vectors. Conditions required to produce equilibrium. Uses of vectors by pilots. The airplane is used for all basic explanations and examples.

**Uniform Motion** (No. 5, 48 frames). Explanation of formulas of uniform motion and their uses. Relation between causes and motion and of distance and time to motion. Complications in motions affecting any one object. Types of motion and difficulties of computing motion in curved lines. Methods of computing average speed and velocity. Stresses importance of using only uniform motion in study of mechanics. Example of complicated motions affecting a man on a ship would require considerable additional explanation by instructor.

**Uniformly Accelerated Motion** (No. 6, 55 frames). Relation of acceleration to time, velocity, and distance. Definition of acceleration and deceleration. Methods of measuring, formula, and problems. Acceleration of bodies at rest or set into motion from rest; acceleration in computing average velocity, distance, and other factors. Includes problems in computing timing on a bombing mission.

**Newton's Laws of Motion** (No. 7, 58 frames). Newton's laws dealing with inertia, change of momentum, and interaction stated, explained, and illustrated. Forces in motion defined. Formulas for computing momentum or impulse and for computing reaction, including strength and vibration factors of machines. Includes example of airplane with guns firing to stress importance of motion and relation of motions.

**Gravitation** (No. 8, 48 frames). Gravitation as universal attraction; Newton's

law of gravitation; Galileo's discovery. Causes and effects of gravity. Methods of measuring distance and time of fall, velocity with which mass strikes ground. Applications of such measurements. Explanations of center of gravity and of torque. Cannon range used in examples.

**Rotary Motion** (No. 9, 58 frames). Definition, examples of, and measurement of rotary motion. Application of Newton's laws. Measuring angular velocity, distance traveled in terms of radians, moment of inertia, torque. Explanation of radius of gyration and axis of rotation. Application examples include spin applied to baseball and to bullet.

**Centrifugal Force** (No. 10, 56 frames). Centrifugal force and centripetal force explained and defined, relation of the two forces. Common examples of centrifugal force and illustrations of its strength. Effects of various factors including velocity, mass, acceleration, or direction of velocity change. Formulas for determining acceleration and central force. Applications. Includes use of vectors in computing problems in flying a plane in horizontal circle.

**Work** (No. 11, 51 frames). Definition and formula. Relation of gravity and of reaction or opposing force. Use of English and metric systems in measurement of work. Determining force, acceleration, and velocity.

**Energy** (No. 12, 52 frames). Explanation of energy and relation to work. Formula for measuring energy by results. Definition of kinetic and potential energy. Method of measuring kinetic energy. Laws affecting energy. Importance of conservation of energy. Indicates changes from kinetic to potential energy and reverse. Water cycle given as example of energy cycle.

**Power** (No. 13, 40 frames). Definition, applications, and measurement of power. Units of measurement and formulas for computing power, kilowatts, horsepower, and the power of rotating machines. Compares rated and delivered horsepower.

**Friction** (No. 14, 53 frames). Definition, explanation, causes, and uses of friction. Kinds of friction, methods of measuring, and how they affect motion. Effects of friction mainly in relation to mechanics, stressing importance of overcoming friction in mechanized civilization, with several examples involving airplanes.

**Simple Machines** (No. 15, 84 frames). Definition of a machine. Five basic simple devices. Ratio of output to input. Computing mechanical advantage of machines. Effect of increase of force on distance. Torque as applied to wheel and axle and to lever. Applications of the simple machines to modern machines. One of the better films in this series.



**Atomic Bomb** (Visual Sciences, si, 75 frames). A general survey of the development, principles, and uses of atomic power presented in line drawings and text. Includes early beginnings, such as ancient alchemists, Roentgen's rays, discovery of radioactivity and radium, radioactive disintegration; explanations of atom, Bohr's theory of atomic structure, atomic structure of uranium, the subatomic family, splitting of uranium atom, atom smashing, new atomic arithmetic, chain reaction, nuclear fission, energy in atom smashing, atom-smashing machines. Uses of atomic energy for military purposes and possibilities for peaceful purposes. Much text, often on same frame with drawing, reducing legibility and clarity of both text and drawings.

**Current Electricity** (Eye Gate, 2 films, si). Part I (67 frames) includes atoms and electrons, movement of electrons, atoms in unelectrified conductors, experiments showing free electrons, electrically neutral units, positive and negative charges, potentials, movements between two conductors, electric current, direction of flow, principle of flow compared with flow of water, effect of generators and batteries, measuring amperes and volts, use of switch, importance of resistance.

Part II (91 frames) includes ohms and their measurement, Ohm's law, potential difference between points on conductor, voltage drop, connection types, voltage, resistance, series and parallel connections, rating of appliances in voltage and watts or kilowatts. Direct-current wattage. These two strips may be used separately or together, as desired. Each part presents much material for one class session, except for review purposes; however, selected sequences or individual frames may be utilized as needed. Treatment is simple, and in general explanations are clear.

**Current Generation** (Eye Gate, si, 80 frames). Principles of current generation presented mainly by diagrams with short captions and brief text. Includes definition; use of dynamos; principle of generation demonstrated by diagram of wire loop between magnetic poles, showing effect of rotation, of open armature loop, sliding contacts; use of commutator and brushes; effect of added loops, commutator segments, and field poles; principal parts of generators. Indicates fundamentals clearly in simple treatment. Somewhat long for one class session.

**Electrical Series** (Long, 8 strips, si). Basic fundamentals of various aspects of electricity. The pictorial material consists mainly of diagrams; the text frames contain questions and problems for class discussion. The treatment in general is theoretical, with little direct application to generators, transformers, meters, or motors and their actual operation. The text frames tend to be lengthy, reducing legibility. Individual titles are listed below with brief listing of subject matter content.

**D.C. Voltmeters and Ammeters** (41 frames). Hot-wire ammeter, methods of measuring flow by weight of copper, magnetism in coil; meter principles, lines of force; galvanometer construction; portable meter; ammeter, shunts, voltmeter.

**A.C. Voltmeters and Ammeters** (30 frames). Cells, magnetic fields, poles, construction of moving iron-vane type of scales, voltmeter construction, inclined coil meter, dynamometer, solenoid gravity type of meters, oscilloscope.

**Transformers** (32 frames). Transformers at Boulder Dam; coils, circuits, primary and secondary units, cores, windings, stepping down of voltage.

**Condensers and Choke Coils** (26 frames). Use of conductors, negatives and positives, adding and removing electrons, attracting and repelling, capacity, series, parallels, action of electrons in direct current and in alternating current. Parts used in condensers.

**Motors** (27 frames). Diagram of early motor, of switch effect, lines of force, current direction, winding on rotor, rotor poles, series motors, automobile-starting motor.

**A.C. and D.C. Generators** (29 frames). Current flow, effect of magnet, changes in lines of force, current in coil, rotating coil, slip rings and brushes, exciter, direct-current generator principles, operation of parts.

**Resistance** (27 frames). Definition, toaster construction, high lines; measurement of ohms, coil-ammeter circuit; problems in measurement, in circuit direction; shunt type of ohmmeter, effect of resistors, resistance in lamp bulbs, uses of lamps.

**Electricity at Work** (43 frames). General overview of uses of electricity including the following: power uses—Boulder Dam, generators, circuit breakers, motors, diesel engines. Heat uses—welder, electric furnace, photo-electric cell, electric eye. Transportation uses—trams, trolleys, bus, elevator, traffic control, fire and police uses. Measuring sound; use in telephone, wire-photo, radio telephone, radio and television, and in medicine. Questions vary from elementary to technical.

• **Electricity** (Filmette, No. 180, si, 105 frames). Photographs and diagrams illustrating fundamentals: generation—frictional, galvanic, simple cell, battery, magnetos, fields of force, solenoids, and electromagnets. Induction—current direction in conductors, Gramme machine, Siemens T armature, other armatures. Applications—telegraph, electric bell, polarized relay, telephony, microphone, differential lamp, incandescent lamp, prime movers, such as motor, locomotive, transformers. Brief identifying captions in German, French, and English. Very long, with too much information for the usual class session, but can be utilized in sequences or by individual frames as required by class needs.



Diagrams are clear and organization of material arranged for easy selection of material.

**Electric Measurements** (Eye Gate, 5 parts, si). The fundamentals of electric-measurement in photographs, diagrams, and brief captions or text. Explanations are simple and in general clear. Individual parts are listed below with indication of subject matter content.

**Part I** (58 frames). Importance of measurement; various types of instruments; length, mass, and time as fundamentals of measurement; International standard of measuring each; Weston cadmium cell, resistance of standard ohm; electric measuring instruments evolved by Weston; principles of voltmeter and ammeter indicated.

**Part II** (91 frames). Voltmeters—use, principles, resistors, multiple-range voltmeters. External resistance ammeters—use, principles of shunt, adjustment of shunt, multiple-scale readings. Internal and external use of shunt, connections on ammeter; master instrument calibrated from Weston standard general use instrument, and by laboratory standard. Use of zero correct. Meters for alternating current and direct current.

**Part III** (88 frames). Effect of direct current and alternating current on polarity field, deflection, control of deflection, extent of rotation, effect of space and positions of iron parts. Operation field coil and series resistors, method of damping, use of transformers to increase range. Instruments using electrodynamic principles.

**Part IV** (71 frames). Use, construction, principles, and operation of power-factor meters and frequency meters.

**Part V** (73 frames). Construction, principles, operation of wattmeter, use on either direct current or alternating current. Principles and construction and use of synchroscope, thermoammeter. Necessity for electric measuring devices.

**Electrical and Mechanical Experiments** (Eye Gate, si, 69 frames). Detailed procedures on building a Wimshurst static-electricity machine from an old phonograph record, indicating experiments that may be carried out on this machine. Also shows methods of building a model of the earliest steam engine. Somewhat long, with résumés of several experiments. May interest some classes as supplementary material although the subject matter is limited in scope.

**Electromagnetism** (Eye Gate, 2 parts, si). **Part I** (91 frames) includes definition of current and direction of flow; magnetic fields, lines of force, increasing magnetic effects, effect of reversing current direction, use of simple electromagnets, construction of large lifting magnets, construction and uses of solenoid; use of electromagnets in generators and motors.

Part II (76 frames) includes stator coils and field coils in generation; multiple-pole generators, electromagnetic induction principle and application, mechanical rotation in generators, circuits in generators, effect of primary on secondary circuits; turn ratio; use of transformers. Both parts are somewhat lengthy, but explanations and diagrams in general are simple and clear. The two parts may be used together or independently.

**Electronics** (Castle, made by USOE, 4 strips, si, manuals). Designed for use in conjunction with motion pictures of the same titles, but may be used independently, particularly for review purposes or as discussion guides. Photographs and diagrams with questions or problems for class discussion, reviewing the material presented in the motion pictures. Individual titles are listed below with indications of subject matter content.

**The Electron—An Introduction** (No. OE 175). Review of nature of electrons, electron flow in solid conductors, electromotive force, control of electron flow, types of electron flow, electron flow and magnetic fields, induced electron flow.

**The Diode** (No. OE 176). Review of principles of electron flow across a gap; basic features of diode tube; control of electron flow in the tube; photo-electric cells; X-ray tubes; the diode as a rectifier.

**The Triode: Amplification** (No. OE 177). Review of diode principle; electric field in diode and in triode; triode amplifier circuit; amplification of direct-current voltage changes; of alternating-current voltages; distortion; amplification of audio-frequency signals. Review of triode principle.

**Principles of Gas-filled Tubes** (No. OE 353). Review of theory of ionization applied to gas-filled tubes; control of current in circuits employing such tubes; use of gas diode as rectifier; action of grid in gas triode; application of gas triode as grid-controlled rectifier.

**Electrostatics** (Eye Gate, 3 strips, si). Part I (60 frames) includes Thales and his experiments with amber; applications of his friction-induced electric charge; attraction and repulsion explained; experiments showing positive and negative charges; use of gold-leaf electroscope; principles of conductors and insulators; use of insulation; influence of charge on conductor.

Part II (68 frames) includes electrostatic induction; nature of electrification produced; atoms and electrons; charges in nucleus; movement of electrons; electrons in electrified and nonelectrified conductors; use of electrophorus.

Part III (67 frames) includes commercial electrostatic machines; charges on surface of conductors; principles of operation of condensers; Leyden jar; discharge of electrons; "electric whirl"; theory of lightning rods; definition of static electricity.

Explanations and experiments, in general, are simply and clearly presented. The



strips are somewhat long for one class session and the text is at times lengthy. The three parts may be used independently or together, as desired.

**Experiments in Physics** (Eye Gate, si, 51 frames). A résumé of experiments in regard to the following: vibrations, vibrating bell, tuning fork; patterns produced by violin notes; weight of atmosphere; expansion of compressed gas; principle of artificial snow. Unrelated experiments reviewed. May be of some interest as review material.

**Fluids—a Unit of Air Age Physics** (Jam Hardy, 13 films, si). Each filmstrip is divided into two lessons; each lesson is followed by a review and a quiz. Principles, problems, and applications are presented in each lesson, incorporating everyday experiments and examples and providing for student participation. Photographs, diagrams, and drawings with captions on the same frame. Text material at times tends to be lengthy. This series has been produced more recently than "Air Age Physics" (described above) and the organization and treatment differ in that this fluids series is divided into lessons, uses less text, and examples or applications given are more general in nature. Individual titles are listed below with indication of subject matter content.

**Liquid Pressure** (No. 1, 75 frames). Lesson 1, "Facts About Liquid Pressure"—pressure as proportional to depth and density. Experiment showing that pressure acts equally in all directions; difference between force and pressure; increase of pressure in direct proportion to depth; formula for computing pressure; water seeking own level—examples, the hydrostatic paradox, applications of facts. Lesson 2, "Computing Force and Pressure"—examples in computations of force and pressure on horizontal and vertical surfaces.

**Transmitting Pressure through Liquids** (No. 2, 62 frames). Lesson 1, "Liquids Transmit Pressure"—experiments. Pascal's law and its application to hydraulic press; other applications of hydraulic principle. Lesson 2, "Mechanical Advantage"—explanation, computation of problems, ways of expressing.

**Buoyancy and Archimedes' Principle** (No. 3, 62 frames). Lesson 1, "What Is Buoyancy"—examples, demonstrations of force of buoyancy, definition and explanation. Lesson 2, "Archimedes' Principle"—experiment, the principle stated, applications given.

**Density and Specific Gravity—Flotation** (No. 4, 66 frames). Lesson 1, "Density and Specific Gravity"—definition of "heavy," relationship of weight and volume, explanation of "density," use of British and metric units in expressing density, specific gravity explained, methods of expressing specific gravity. Lesson 2, "Facts About Flotation"—examples, laws, applications.

**Specific Gravity of Solids and Liquids** (No. 5, 82 frames). Lesson 1, "Finding the Specific Gravity of Solids"—use in identifying materials; relation of

Archimedes' principle to specific gravity; uses of specific gravity determination; methods of finding specific gravity of solids lighter than water and heavier than water, sample problems. Lesson 2, "Finding the Specific Gravity of Liquids"—uses of specific-gravity determination of liquids; explanation and demonstration of methods, including bottle, loss of weight, and hydrometer methods; problems and applications.

**Atmospheric Pressure** (No. 6, 70 frames). Lesson 1, "The Air Ocean"—explanation of "air ocean" and of "atmosphere," experiments proving air takes up space and has weight; examples and demonstration of balanced and unbalanced air pressure. Lesson 2, "Atmospheric Pressure at Work"—demonstrations of atmospheric pressure; why liquids rise in exhausted tube; applications in pump and automobile engines; Toricelli's experiments; computing from mercury-column height.

**Exploring the Atmosphere—Streamline Flow** (No. 7, 80 frames). Lesson 1, "Exploring the Atmosphere"—atmospheric pressure and altitude; Pascal's experiment; density of atmosphere and altitude; applications of variations (particularly in aviation), the three layers of the atmosphere. Lesson 2, "Streamline Flow"—examples in nature; meaning of streamline flow; influence of moving object's shape on fluid flow; development of streamlining in transportation; fluid friction; turbulent flow.

**Barometers and the Weather** (No. 8, 84 frames). Lesson 1, "Kinds of Barometers"—variations in atmospheric pressure; uses of knowledge of variations; Toricelli's apparatus for measuring pressure; modern mercury barometer; aneroid barometer—principles and construction, applications, units used to express measurements of atmospheric pressure. Lesson 2, "Barometers and Weather Forecasting"—use of barometric readings in forecasting, application to weather maps; isobars explained; basic circulation and movement of highs and lows; importance and applications of weather forecasting; use of barometers for home weather forecasting.

**Gas Pressure** (No. 9, 64 frames). Lesson 1, "Gases Are Compressible and Expansible"—experiments proving compressibility and expansibility of gases; applications. Lesson 2, Boyle's Law—Boyle's experiment, the law stated and explained, expressed as formula; sample problems.

**Measuring Fluid Pressure** (No. 10, 55 frames). Lesson 1, "Measuring Liquid Pressure"—applications of liquid-pressure measurement; the Bourdon gauge; units of pressure; head of pressure. Lesson 2, "Measuring Gas Pressure"—applications of gas-pressure measurement; automobile tire gauge, principles and construction; use of manometer and Bourdon gauge in measurements; vacuum gauges; applications.



**Bernoulli's Principle** (No. 11, 61 frames). Lesson 1, "Fluid Pressure vs. Fluid Velocity"—examples of Bernoulli's principles; explanation of relationship between fluid pressure and fluid velocity; statement of Bernoulli's principles; simple examples and applications. Lesson 2, "Applications of Bernoulli's Principle"—how principle explains lifting effect of air on plane's wings; other applications as in carburetor venturi and bunsen burner.

**Reciprocating Pumps** (No. 12, 89 frames). Introduction—the three types of pumps and their basic principles. Lesson 1, "Reciprocating Liquid Pumps"—principles and operation of lift pump, deep-well or force pump; other types as in steam plants, aboard ship, automobile fuel pump, radial piston pump; reciprocating liquid devices for performing work such as in hydraulic press, hydraulic-brake system, hydraulic motor. Lesson 2, "Reciprocating Gas Pumps"—vacuum pump, compression pump, principles and applications. Reciprocating gas devices for performing work—steam engines, internal-combustion engine, pneumatic tools.

**Jet Pumps, Siphons, Rotating Pumps** (No. 13, 90 frames). Lesson 1, "Pumps with No Moving Parts"—chimney as a pump; principles and applications of atomizers and spray guns; principle and uses of jet pump or air ejector, aspirator, siphon, hydraulic ram. Lesson 2, "Whirling Pumps"—basic principle; three general types—propeller, centrifugal, and rotary—and applications of each. Principles of operation and uses of eccentric pump. Rotating fluid devices for performing work—windmill, water wheels, water turbine, steam turbine, gas turbine, fluid-drive systems.

**Magnetism, Electrical Strength, Sparks** (Filmette, No. 179, si, 81 frames). Diagrams and photographs illustrating fundamentals, including magnetism—lines of power, magnetic poles, disturbances, types of magnets, earth magnetism, iogenes, potential lines, lines of power of vertical currents, of circular currents, disk condenser, Leyden jar and antenna. Passage of sparks—various forms including band, thread, flamelike, and ramified. Electric discharge in gases, cylindrical discharge, northern lights. Brief identifying captions in German, French, and English. Too much material for one class session, but may be shown in sequences as desired. Good illustrative material and clearly presented diagrams.

**Mechanics and Heat** (Filmette, No. 177, si, 120 frames). Drawings and diagrams of basic principles, laws, and of various types of apparatus. Includes mechanics of solid bodies—center of gravity, equilibrium, simple machines, dynamics, centrifuge machine, and pendulum. Mechanics of liquid bodies—spirit level, Archimedes' principles, hydrostatic balance, water wheels; gaseous bodies—barometers, pressure gauges, siphon. Heat—expansion of solids, liquids, and gases. Measurement of heat, types of thermometers and calorimeters, diffusion of heat by

conduction and convection; heat and work—boiler, steam engine, and steam turbine. Gas engines—two- and four-stroke principles, refrigerator principles. Brief identifying captions in French, German, and English. Too much material for one class session but may be shown in separate sequences as desired, or in entirety for preview or review of unit. Good illustrative material and clearly presented diagrams.

**Principles of Liquids and Gases** (Castle, made by AAF, No. FS 1-22, si, 75 frames). Opens with uses of liquids and gases in planes and in pneumatic army equipment. Presents the following: liquids and gases as fluids, definition and forms of fluids; principles of liquids—as transmitter of force—Pascal's law of transmission of force, applications, effect of pressure on liquids, hydraulic applications. Principles of gases—definition, expansion, compressibility, Boyle's law, relation of volume and pressure, volume and temperature, pressure and temperature, vapor, sublimation, change of atmosphere vapor to other forms. Frames 45 to 75 indicate applications of principles of liquids and gases in airplanes, including effect of frost on plane, principal gases and liquids used in planes, properties and uses of carbon dioxide gas, need of human body for oxygen, oxygen equipment, air in de-icers and in heating, steam for heating. Introduction of about 9 frames may be omitted if desired. Last 30 frames apply specifically to airplanes and may be also omitted unless of special interest to class. Central portion of film explains the principles clearly (frames 9 through 45) and may be shown in entirety or in sequences. Well organized, with clear and brief explanations.

**Properties of Sound Waves** (Eye Gate, si, 73 frames). The following experiments and demonstrations: production of sound illustrated by making a glass bell sound with violin bow and by vibration of tuning fork; free-running steel balls illustrating how particles of air transmit sound; flame as sensitive to sound vibrations; lines of vibration on metal disk covered with sand and in glass bell filled with methylated spirit; experiments with vibration of membrane, experiments showing harmonic vibrations; simple apparatus for recording harmonic vibrations and designs produced by such apparatus from various vibrations. Title is misleading as the strip does not cover all properties of sound waves, might better be titled "Experiments in Sound Waves." The sequence in harmonic designs is particularly interesting. All experiments shown are simple enough to be conducted in most schools and therefore this strip may be of value primarily as review material.

**Sound** (GE, No. L-102, si, 29 frames, lecture notes, loan). Uncaptioned photographs and diagrams present information on the physical properties of sound waves, description of the characteristics of sound, and various methods of analyzing these characteristics. Ending sequences provide general operational principles



of telephone and carrier current communication. The lecture notes are lengthy but information of the type provided is necessary, since the strip does not carry either text or captions. The film is an introduction to sound and its phenomena, and may be most useful either as introductory or review material. The diagrams are clear and simple; and are well adapted for rapid blackboard reproduction. **Story of the Induction Coil** (Eye Gate, si, 80 frames). Opens with diagrams showing induced current in simplest form—magnet thrust through copper-wire spiral and withdrawn. Indicates effect increase by coil of many layers of wire; alternating current by mechanically driven magnet; use of mercury; solenoid coils; increase of power in solenoid; device alternately to make and destroy magnetism; use of condenser; secondary coils; difference in current in primary and secondary coils; use in fluorescent light; experiments. Numerous long text frames that describe current action; the photographs and diagrams are clear but do not indicate the current action as described.

**Vacuum Tubes** (Castle, made by U.S. Navy, No. SN-650, si, 37 frames). Definition and uses in radio of vacuum tubes; electric light bulb as simple example; action of electrons; operation of filament, plate, cathode; current movement. Use of metal grid in triode; effect of grid voltage on plate current. Amplification factor of tube. Amplification of signal voltages in radio-antenna circuit. Audio-coupling devices. Designed to apply specifically to equipment used by the U.S. Navy but suitable for use in any physics course treating with vacuum tubes. Clearly and briefly presented.

**Visiograph Filmrols for Physics** (Chicago Apparatus, 6 films, si, textbook "Physics Made Easy" by L. T. Masson). Drawings, diagrams, and graphs reproduced from the illustrations in the textbook "Physics Made Easy" by Louis T. Masson. The organization of subject matter follows that of the text. The strips, if shown in entirety, may be utilized for introductory or review purposes. However, each frame can be shown independently for illustration of specific items and selected sequences or single frames may be shown as desired or used for rapid blackboard reproduction. Many of the illustrations are the same as those appearing in the "Visiograph General Science" series, described elsewhere. Individual titles follow with listing of the charts, drawings, and diagrams in the order in which they appear in the strip.

**Fundamentals of Physics, Forces and Fluids** (No. P-1, 28 frames). Physics in daily life, matter and energy, surface tension, capillarity, mass and weight, volume by displacement, pressure and total force, liquids seeking own level, hydrostatic paradox, pressure transmission by liquids, hydraulic press, Archimedes' principles, density ball, specific gravity, specific gravity of a liquid, balancing columns, flotation and the hydrometer, air has weight, weight

of air, atmospheric pressure, mercury barometer, aneroid barometer, buoyancy of air, man's altitude achievements, Boyle's law, air pump, force pump, lift pump, siphon.

**Motion of Bodies, Work and Machines** (No. P-2, 29 frames). Center of gravity, equilibrium, composition of forces, parallelogram method, components and resultant, concurrent forces, resolution of forces, pendulum, uniform acceleration, Newton's first law, inertia of motion, centrifugal force, Newton's second law, momentum, Newton's third law, Bernoulli's principle, work formula, kinetic energy, horsepower, everyday uses of machines, relation of input and output, mechanical advantage, inclined plane, screw and wedge, pulley, lever, force arm of lever, three classes of levers, wheel and axle.

**Nature of Heat, Transformation of Heat Energy** (No. P-3, 27 frames). Heat and temperature, heat content and temperature, temperature scales, familiar values in temperature "ladder," differential expansion, expansion of water and floating of ice, expansion of gases, transmission of heat, Davy safety lamp, conductivity of fluids, convection in liquids, convection in gases, radiation, how surface attracts radiation, thermos bottle, calorie and B.t.u., specific heat, heat of fusion, cooling by evaporation and mechanical refrigerator, boiling point and pressure, heat of vaporization, absolute and relative humidity, hygrometer, air conditioning, mechanical equivalent of heat, Joule's apparatus, steam engine, four-stroke gasoline engine.

**Sound, Magnetism, Introduction to Electricity** (No. P-4, 26 frames). Vibrations causing waves, no sound transmitted through vacuum, longitudinal and transverse waves, wave motion in air, frequency and wave length, sympathetic vibrations, echoes, resonance, beats, frequency determines pitch, properties of musical tones, laws of vibrating strings, lines of force in magnetic fields, laws of magnetism, theory of magnetism, induction and permeability, three methods of magnetization, induced magnetism, declination and inclination, laws of static charges, electron theory, charges by friction, charging by induction, charging an electroscope, condensers, electrical discharges—lightning.

**Fundamentals of Current Electricity, Effects of Electricity** (No. P-5, 30 frames). Action of voltaic cell, defects of simple cell, units of electricity, laws of resistance, power and energy in electricity, cells in series, cells in parallel, resistance in series and in parallel, electricity produced magnetism, Oerstad's discovery, electromagnet, electric bell, electric telegraph, d'Arsonval galvanometer, measuring pressure, voltammeter and Wheatstone's bridge, complete electric circuit, sodium-vapor and arc lamps, electric heating, electrolysis of water, electroplating, storage cell, induced currents, Lenz's law, alternating-



current generator, direct-current generator, paper-clip motor, induction coil, transformers, telephone, vacuum tube.

**Fundamentals of Light, Refraction and Color Phenomenon** (No. P-6, 35 frames). Velocity of light, luminosity, pinhole camera, types of shadows, eclipse of sun, eclipse of moon, intensity of illumination, bunsen photometer, electric eye, reflection of light, kinds of reflection, types of images, image in plane mirrors, image in curved mirrors, virtual images, refraction of light, rays and angles in refraction, index of refraction, refraction by triangular prism, total refraction, converging and diverging lenses, principal terms describing lens, camera and human eye, water lens, parts of the eye, optical system, defects of eye projection lantern, stroboscope, simple microscope, dispersion of light, cause of dispersion, selective absorption, selection transmission, polarization of light.

See also the sections on General Science, Engineering, and Basic Electricity, and the following titles for supplementary, illustrative, and related materials:

The Slide Rule

Aerodynamics

Aerial Navigation: Radius of Action

Pilot Training Series

Wing Forces

Dead Reckoning

Pilot Problems

Aircraft Mechanics Series

Flight Instruments

Forces in Flight

Lift and Drag

Plane Performance

Stability

Stresses in an Airplane

Aviation Metalsmiths Series

Properties of Metals

Machine-shop Work Series

Precision Measurement

Units of the Automobile Series

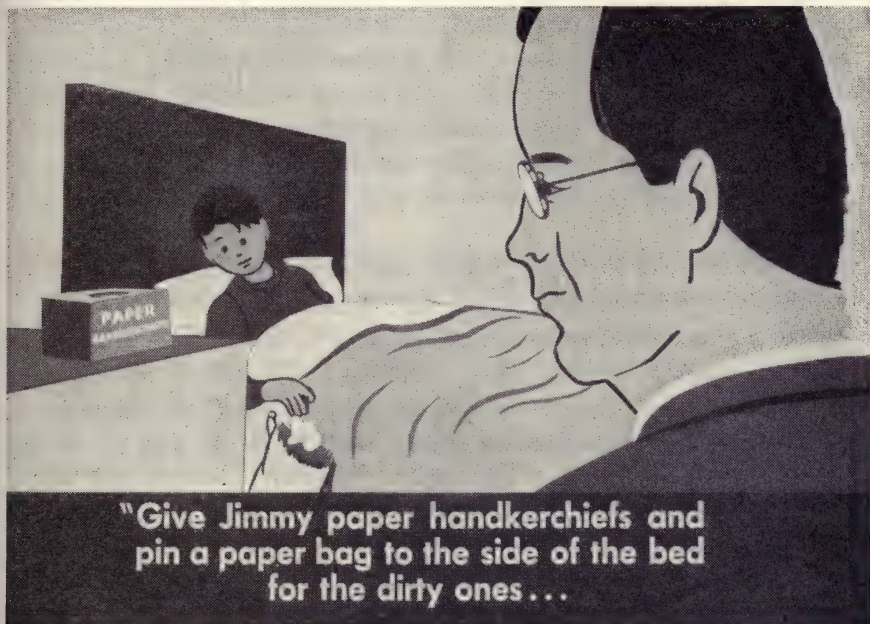
Four-stroke-cycle Internal-combustion Engine

Mechanical Linkage

Electricity and the Storage Battery

## PHYSIOLOGY AND HYGIENE

This subject has been receiving considerable emphasis in curriculums, particularly in the elementary schools; and therefore it is not surprising to find a large selection of visual aids. However, as is true in other fields, coverage is spotty. Perhaps this is the case here because of the frequent variations in emphases in



From filmstrip "Pesky, the Cold Bug." (Young America Films, Inc.)

health and hygiene courses. For instance, dental health occupied the spotlight, and then care of the eyes, and again nutrition. Of course, these phases are all important to the student in this field and have become absorbed more definitely into the complete courses, sharing class time more equally with other phases. However, such emphases have tended to unbalance the selection of subjects to receive visual treatment.

There is a lack of materials concerned with topics other than personal health, particularly in community health; also in topics of interest to older groups, such as mental health, parenthood, and the health problems of advancing years. This latter scarcity of filmstrip treatment may be caused by the tendency to produce materials for the elementary school, in which the pupils are not so greatly con-



cerned with problems of this nature. However, a group of new productions, designed for use with Dr. Harold S. Diehl's "Textbook of Healthful Living"<sup>1</sup> should when released provide valuable aids in these particular areas. As Dr. Diehl says in the preface to his text, the book is written "for those who prefer facts to fads, sanity to superstition, understanding to belief." It is to be hoped that the forthcoming materials will follow the same premise, and assist the instructor in guiding the student to knowledge useful in his role as an individual, in marriage and parenthood, and in his community.

In the following lists of filmstrips, those concerned with physiology and hygiene have been grouped together because many of the materials contain subject matter pertinent to both. A few subclassifications on related topics follow this major section and are grouped separately, since they may not be of primary interest to the majority of public school courses in this field, but can be located easily if need for them arises.

Uses of filmstrips in physiology, hygiene, and related subjects include

1. Illustrating body structures, organs, and functions.
2. Showing bacteria and their effects, life cycles of insect disease carriers and similar material, especially when equipment is not available for laboratory demonstration. If laboratory demonstrations are possible, the filmstrips can be useful in indicating to the student what he should look for in the microscope.
3. Providing motivation, especially on the elementary level, for observance of health rules.

**A Day with Bobby and Ellen** (Popular Science, 5 filmstrips, si, about 35 frames each, teacher's guide). This new series for primary or lower elementary health education uses a story device that provides excellent motivation for acquiring good health habits. There is no attempt to "lecture" the children viewing the strip and the health rules are introduced as a normal part of everyday life. The series is the story of one day in the lives of Bobby and his small sister Ellen. Since Ellen is of preschool age, most of the demonstration of healthful habits is done by Bobby. Photographs show the children's activities. Simple brief superimposed captions carry the story and present many questions or suggestions for pupil participation. Each strip ends with a photo quiz and provides an opportunity for the viewing class to relate their own activities during the hours portrayed in the strip. Individual titles are listed below, with indications of types of activities portrayed in each.

<sup>1</sup> DIEHL, HAROLD SHEELEY, "Textbook of Healthful Living," McGraw-Hill Book Company, Inc., New York, 1940.

**Getting Ready for Bed** (39 frames). Introduction of the two children; mother puts Ellen to bed while father and Bobby finish a jigsaw puzzle. Bobby gets ready for bed: hanging up clothing, putting dirty clothing in laundry, getting next day's clothing ready, cleaning shoes, washing and brushing teeth, open window, need for plenty of sleep.

**Getting Ready for School** (35 frames). Washing hands and face, using plenty of soap, brushing teeth, hanging up bathrobe. Breakfast—milk, importance of good breakfast. Bobby gets sweater and starts for school; crosses street with the light.

**A Day in School** (37 frames). Hanging up outdoor clothing, the morning checkup, proper room temperature, adjusting ventilation, planning day's work, feeding the fish, learning first aid, recess time, drinking milk, studying, lunch-time washing, proper foods; learning to tell time, hobbies, drawing; care in crossing street on way home.

**After School Hours** (35 frames). Drinking milk, proper outdoor clothing, playing outdoors, sharing toys with others, playing at playground, covering nose and mouth when sneezing; children go home when weather darkens, since they are not dressed for rain; washing up for dinner.

**At Home in the Evening** (35 frames). Helping mother get dinner, foods at dinner as example of good diet, stress on milk at every meal; helping to clean up after dinner. Ellen trips on toy and cuts knee; mother bandages it. Bobby puts away toys. Bobby reading—stress on proper lighting and correct distance between eyes and page. Bobby tired and ready to go to bed.

**Bending the Twig** (Eye Gate, si, 57 frames). Hygiene rules for children, including importance of cleanliness as first health habit, proper washing, brushing teeth, fresh air, early bed hours, eating habits—harm of eating too fast, of eating between meals, importance of proper diet—correct shoes. Subject matter and treatment suitable for lower elementary grades.

**The Circulatory System—Blood Vessels and Their Function** (Eye Gate, si, 117 frames). Diagrams and photographs explaining function of circulatory system, including diagrams of course of blood flow and of arteries, veins, and capillaries. Course of blood through heart shown in dissected organ as well as in diagrams. Interchange of food and waste between capillaries and body cells diagramed. Indicates methods used to tell rate of heart beat, force of heart action, and condition of blood vessels. Stresses need for periodic examination. Subject matter and treatment suitable for senior high school or first-year college physiology classes. May also be of interest as supplementary material in biology classes. Very long but could be shown in sections if desired.



**Circulatory System—The Heart and How It Works** (Eye Gate, si, 97 frames). Diagrams and photographs of dissected heart show parts of the heart, action of valves, functions of heart. Systole and diastole defined. Circulation of blood compared with water-supply system of large city; diagrams show location of circulatory system parts. End sequences state importance of yearly examination. Subject matter and treatment suitable for senior high school or first-year college classes. May interest biology classes as supplementary material. Very long for one class session, but may be shown in sections if desired. Can be used in conjunction with "Circulatory System—Blood Vessels and Their Function" described above.

**Dental Health for the School Child** (American Dental, si, 41 frames, lecture notes). Stresses importance of good teeth for health and appearance. Compares good and poor teeth; provides statistics on percentage of dental defects among school children. Diagrams show the deciduous teeth and the permanent set; construction of a tooth. Four rules of proper dental care presented. Shows development of cavity, X-ray of abscess, results of dental neglect. Subject matter and treatment suitable for upper elementary or junior high school hygiene or physiology classes. Lecture notes provide additional information not included in the brief filmstrip captions. More information than "Your Teeth and Your Health," described below.

**Digestive System** (Eye Gate, si, 88 frames). Diagrams show location and appearance of digestive tract, urinary organs, lungs, and heart. Major portion of film includes diagrams and photographs showing the various parts of the digestive system beginning with the mouth. Purposes of organs in abdominal cavity stated. Passage of food through digestive tract diagramed, including absorption by blood and transmission to body parts. Subject matter and treatment suitable for senior high school or first-year college physiology. May interest biology classes as supplementary material also. Very long for one class session but may be shown in sections if desired.

**Elementary Physiology** (SVE, si, 47 frames, manual). A series of diagrams for use in physiology classes, including the following: comparison of plant cell and human cell; hair follicle and sweat gland; muscle fibers; front and back views of superficial muscles of human; methods by which muscles are attached; action of biceps; major bones of the body; various joints; cross section of brain; vital organs of thorax; lymphatic system; circulatory system; food absorption; eye; ear; nose; cross sections of skin; the vocal chords. Diagrams are clear and readily legible. Material suitable for use in any physiology class and may interest biology classes as supplementary material. The strip is not designed for showing in entirety (except where desired for rapid review). The diagrams may be shown as

needed, a frame or a sequence at a time, or may be used to simplify the drawing of such diagrams on the blackboard.

**Eyes on the Job** (Better Vision, sd, 96 frames, 20 min, loan). Cartoons show Sammy Squint's experiences during one day's work at the factory beginning with his difficulties in driving to work, poor production, headaches, inability to read the micrometer, and similar problems. Foreman gives him information on accidents caused by bad sight. Sammy visits an eye specialist; the trouble diagnosed as nearsightedness. Proper glasses and their effect on Sammy's personality and happiness. Explanation of human eye as camera and of the use of lenses to correct faults included. Pictorial material all cartoon drawings; narration given in verse. Suitable for high school or college, particularly for physiology, hygiene, or foremanship classes. May also interest shop courses and vocational schools. Presents good information although treatment is somewhat heavy-handed at times.

**The Fly as a Disease Carrier** (Eye Gate, si, 111 frames). Explanation of how flies transmit disease: disease-carrying parts; microscopic views of culture plates showing bacteria collected from fly's feet; diagram of farmyard showing fly's progress from manure pile to milk pails, pigpen, outhouse, kitchen. Diagrams showing how fly spreads disease by proboscis. Germ content of fly's excreta. Graphs showing relation of prevalence of flies to deaths from typhoid. Life cycle of fly. Methods of controlling flies. A thorough presentation of this subject, suitable for high school physiology classes. May interest biology classes as supplementary material and first-year college physiology or health classes as review material. Very long for use in one class session, but may be shown in sections if desired.

**Food and Nutrition** (Popular Science, 5 strips, si, color, teacher's guide). This recently produced series includes important information on nutrition that is not usually incorporated into visual presentations of this subject. This new material includes emphasis on attractiveness of serving and pleasant atmosphere during meals and methods of purchasing food wisely. All phases of nutrition, from purchasing to diet essentials and digestion of foods, are here presented in one unit, allowing for a practical approach to dietary needs and understanding of the relationships of economy, hygiene, and physiology of the problem of nutrition. The first three strips, described below, outline nutritional requirements and the sources of nutrients simply and briefly. The information can be expanded as necessary for class needs. The other two strips, on digestion and on purchasing of foods, present complete and detailed information. All of the strips contain a number of devices for student participation—identification quizzes, completion summaries, and questions. The pictorial material uses both photographs and



drawings. Captions and text frames are short. Treatment and subject matter is suitable for upper elementary and junior high school classes. The one describing purchasing may also be of interest in high school home economics classes. Individual titles with descriptions follow:

**Eat Well! Live Well!** (41 frames). The five aspects of nutrition stated and then discussed briefly: (1) What does the body need? Pep, growth, minerals, vitamins. (2) What foods supply these needs? Daily needs for milk, vegetables, fruits, meat and eggs, fats and sweets, water. (3) How shall we buy, store, and care for food wisely? Stress on refrigeration. (4) How shall we prepare food properly? Warnings against overcooking, using too much water, throwing away water in which cooked. (5) How shall we serve food and keep a pleasant atmosphere? Attractive serving, cleanliness, conversation at meal-times, manners. Brief summary quiz after each section. An introductory outline of nutrition.

**The Essentials of Diet** (48 frames). Desire to grow, be active, and healthy as reasons for eating proper foods. Joe Rickets, Mike Stout, and Sickly Sue as examples of improper diet. Need to know and understand food facts. Locomotive used to stress importance of this knowledge; questions for class, such as would you expect it to run on ice-cream soda, could you repair it with newspapers? Calories explained, amount needed as governed by activities, effect of too few or too many. Balanced diet: the seven basic food groups, types of foods in each; need to include some of each in daily diet. Emphasis on getting proper amount of calories through a balanced diet.

**The Nutrients in Foods** (54 frames). Opens with body needs for right foods for growth, energy, and health protection. Indicates body uses for the various nutrients and sources of each nutrient, including proteins, carbohydrates, and fats, minerals—stressing calcium and iron—vitamins A, B, B<sub>2</sub>, niacin, C, D, and K.

**How Food Is Digested** (56 frames). Flow of food traced through the body from the mouth to final use by parts of the body. Digestive system shown, functions of each part given; enzymes in digestive juices presented in cartoon and their purposes indicated; absorption of food; how food is supplied to parts of the body and what the body uses the food material for. Followed by sequence indicating need for proper elimination; suggests drinking plenty of liquids to aid in prevention of constipation. Aids to good digestion suggested: eat in happy frame of mind; avoid anger or worry; rest and relax before and after meals; take time to chew; eat at regular times. Ends with frame of research puzzles.

**Consumer Problems in Nutrition** (44 frames). Mother explains principles of wise purchasing to daughter: (1) Planning wisely—planning quantity, examples of foods which are good buys in various nutrients, planning for enjoyment. (2) Buying quality—information on grades of milk, eggs, meats, qualities of fresh fish and of good poultry, selecting good vegetables; grades of canned products and what each means. (3) Buying quantity—don't buy more than you need or more than you can store properly, ask prices before you buy, watch the scales, read labels.

**General Personal Hygiene** (Eye Gate, si, 100 frames). Opening sequence indicates role of heredity, environment, and personal development; compares Edison at 75 and Dr. Stephen Smith at 100 with "down-and-outer"; compares human engine with locomotive in need of care. Health rules given and illustrated, such as fresh air, cleanliness, exercise, eye care, etc. Heredity charts show passing down of mental traits, ending with statement "Children have a right to be well born; when selecting a mate think of the kind of children you would like to have." Very long for most class use. Clothing shown in photographs is outmoded. Organization not clearly defined for teaching purposes.

**Good Health** (Young America, 6 films, si, 40—45 frames each, teacher's guide). This recently produced series of health films for intermediate grades provides good motivation and acceptable reasons for development of proper health habits. The treatment combines motivation with straightforward factual information. Simple drawings with brief superimposed captions visualize each subject interestingly and clearly. Questions and suggestions for pupil participation are included in all the strips; and all, except the strip on cold germs, end with brief tests. Individual titles with brief descriptions appear below.

**You and Your Clothes** (No. 1, 41 frames). Introduction indicates that primitive men wore clothing for protection (skins, woolens) and that today we also wear clothing for the same purpose, but have special clothes for each kind of weather. Stresses comfort. Shows proper clothing for hot, cool, cold, and rainy weather. Second part presents methods of caring for our clothing, neatness, changing to fresh clothing, bathing.

**Pesky—The Cold Germ** (No. 2, 45 frames). Cartoon character Pesky introduced as "boss of the cold germs." Pesky indicates ways in which body can be weakened and permit cold germs to get in; how the germs are spread; tells about "Always Take Care Land" where proper precautions against colds are taken and its effect on Pesky.

**You and Your Food** (No. 3, 44 frames). Introduction gives the three main purposes of food, indicating need for proper foods. Following sequences show use, sources, and foods containing carbohydrates, fats, proteins, minerals, and



vitamins. Purposes of vitamins A, B, C, and D given. Food elements in milk indicated.

**Your Posture—Good or Bad?** (No. 4, 45 frames). Introduction shows examples of poor posture and gives causes as bad habits in sitting, standing, and walking. Need to train muscles—drawings showing spine in good and bad posture. Experiments—difficulty of breathing when slumped. Other causes of bad posture: how you feel mentally; lack of sleep; infections in teeth, tonsils, ears; improper food. Ways in which to help your posture—clothing, food, sleep, practice, stop worrying. Stresses fact that good posture improves appearance and makes you feel better.

**Bacteria—Good and Bad** (No. 5, 42 frames). Introduction points out that some of the plants about us are helpful, others poisonous or harmful; presents bacteria as tiny plants also either good or bad. Harmful bacteria; examples of damage to food and health; need for pasteurization of milk and purification of water; spread of germs; methods of keeping germs out of the body; community aids to control of germs.

**Insect Pests and Disease** (No. 6, 45 frames). Introduces mosquito, louse, bedbug, coachroach, and fly as dangers to health. Following sequences treat with each separately. Mosquito and fly in longer sequences: brief life history, breeding places, control methods. Control methods for others given. Stresses control as a community and personal problem. Indicates dangers of infection if bites are scratched.

**The House of Vision—Story of the Eye and How We See** (Better Vision, sd, 112 frames, 25 min, loan). Story of two boys and a teacher who explains how the human eye works, comparing it with a camera. Diagrams of eye parts and their functions. Effects of eye faults on vision. Importance of sight conservation and proper examinations. Effects of glasses on eye faults. Story of Theodore Roosevelt's eye troubles told. Subject matter and treatment suitable for elementary and junior high school hygiene or physiology. Filmstrip is lengthy and pictorial frames are often held long on the screen. Sequence showing effect of eye faults on vision particularly good.

**How Disease Is Spread** (Eye Gate, si, 109 frames). Indicates extent of preventable diseases and fact that these may be remedied by everyone working to prevent spread of communicable diseases. Methods of germ transmission illustrated in story of girl traveler who suffers from tuberculosis: germs from money, hands, water glass in restaurant, kissing, etc. Need for care and sterilization of articles used. List of communicable diseases; maps showing spread of disease from one carrier. Precautions in the home indicated.

Good device used, but clothing of girl traveler and other persons much outmoded, dating the strip. Subject matter suitable for high school or upper elementary hygiene.

**How Plants and Animals Cause Disease** (Eye Gate, si, 133 frames). Opening sequence shows mistletoe as example of parasite; diagrams indicate how it feeds upon its host. Bacteria as examples of plants that feed upon plant or animal material: method of feeding, digesting ferment, division, poisoning caused by excretion of waste. How bacteria enter the body. Need for sterilizing every scratch. Views of several disease-causing bacteria. Diagrams of malaria parasite's action upon corpuscles. Mouth as culture bed for bacteria. Necessity to have decaying teeth cared for. Formation of abscesses. Tuberculosis bacilli, precautions and some principles of cure. Very long and a great deal of information for one class session; suggest that it be shown in sequences as needed. Sequences on mistletoe and on bacterial-feeding methods and growth better than others in strip. Subject matter suitable for high school classes.

**How's Your Eyesight?** (Eye Gate, si, 40 frames). Diagrams of normal eye; effect of in-focus and out-of-focus vision; effect of lengthened eyeball and of flattened eyeball; methods of correction with glasses. Eye muscles; eye movements; effect of permanently tightened muscles.

**How We See** (Eye Gate, si, 40 frames). Diagrams of eye with parts compared with those of camera; purpose of each part; process of "seeing." Both films suitable for high school physiology or hygiene classes. Diagrams clear and legible. The two films may be shown separately if desired.

**How the Mosquito Spreads Disease** (Eye Gate, si, 157 frames). Life cycle of anopheles; method of recognizing anopheles larvae. Feeding methods of larva. Positions of adult anopheles and culex compared. Feeding process of female anopheles, showing entrance of malaria germs into mosquito. Life cycle of malaria germs inside anopheles. Injection of germ sporozoites into person stung by mosquito. Cycle of parasite in human blood. Control methods listed. Very long, but sequences showing life cycle and development of parasite are in numerous drawings that can be shown rapidly. Suitable for high school classes and may interest first-year college classes as review material.

**How to Prevent Disease** (Eye Gate, si, 67 frames). Water supply as disease control; reservoirs and supplies used by large cities; diagrams showing how wells may be contaminated and where they should be placed; graph shows lowering of typhoid epidemics by improved water supply. Milk supply; need for pasteurization. Use of quarantine; vaccination; Schick test. Meaning of immunity and of epidemic. Graphs showing decline of death rate in New York City following



application of disease-prevention principles. Some excellent material, but very long, the treatment is general in scope, and pictorial frames do not fully illustrate. Clothing shown is much outmoded.

**How We Breathe** (Eye Gate, si, 59 frames). Diagrams showing exchange of oxygen and carbon dioxide between simple cells and surrounding air; body cells requiring oxygen but not surrounded by air. Heart as pump supplying air to



From filmstrip "How We Hear." (Eye Gate House.)

cells and removing waste products. Diagrams showing how oxygen passes from small blood vessels to body cells. Transfer occurring in lungs. Provision for continual air supply to cells. Good diagrammatic discussion of method by which oxygen reaches cells. Title misleading, as strip does not deal with respiratory process.

**How We Hear** (Eye Gate, si, 57 frames). Diagrams of parts of ear; comparison of ear and telephone. Diagrams showing how impression of sound is sent to the brain. Suitable for use in upper elementary or high school physiology classes. Diagrams are clear and legible.

**The Human Voice** (Eye Gate, si, 63 frames). Anatomy of vocal equipment and methods by which vocal sounds are produced. Diagrams of location of voice box,

nasal passages, and windpipe; purpose and action of epiglottis. Location of vocal cords; action as shown by laryngoscope. Diagrams of vocal-cord position as various musical notes are produced. Reasons for pitch difference in men's and women's voices. Use of nose, mouth, and throat as resonance chambers, shown in pronunciation of several vowels and consonants. Suitable for high school physiology classes. Although long, may be shown rapidly, particularly sequences giving position of cords in making various sounds.

**The Magic Camera** (Westinghouse, sd, 15 min, booklet "Eyesight Protection Through Adequate Home Lighting," loan). Description of how the eyes work and the kind of artificial light they need. Opens with comparison of the eyes (the magic cameras) to magician. Group asked to imagine white horse on blank screen—narrator explains how eyes are able to do this by filing away pictures "taken by the eyes." Parts of eye and their functions compared with parts of camera; simple explanations of lens, retina, rods, and cones with emphasis on work of rods and cones and their need for sufficient light. Examples of work done by eyes during day; kind of light needed indoors; proper placement. Rules for proper eye care. Stresses importance of good light for good sight. Good pictorial material, but pictures are at times held long on screen. Subject matter and treatment suitable for elementary hygiene, general science, and physiology classes.

**The Marvel of Vision** (Better Vision, sd, 25 min, loan). Importance of the eye and of good vision in everyday life and as basis for man's progress. Explanation of how human eye works, compared with simple eye of fly and of squid. How man extended vision through telescopes and microscopes. Part light plays in function of vision; rules for correct lighting. Principle of glasses to correct faulty vision. Two stories told: one concerning a king and one of his subjects who claims to be blind, and the other of a small girl with defective vision. Good subject matter for elementary and junior high school classes. Somewhat long for most class periods, and at times pictorial matter is held long on the screen. The two stories at the end add little to the educational value of this strip.

**The Mortons Make Some Changes** (American Dental, sd, 27 min). Stresses need for proper dental care for entire family through a story concerning the Morton family. Dentist explains how infected teeth affect health. Diagrams show types of dental troubles, typical locations of dental infections, and ailments that may be caused by abscessed teeth. Proper diet is indicated. Better health and appearance following proper dental care emphasized.

Good information for high school physiology and hygiene classes. Part of pictorial material static, showing merely persons talking because of story form of presentation. Diagrams and explanations clear and well presented.



**Nutrition** (ACE, No. 27, si, 50 frames, lecture notes). Uncaptioned photographs presenting results of poor nutrition, the seven basic foods and their sources, and results of proper nutrition. Lecture notes provide information. Also includes material on promotion methods for proper diet; proper refrigeration, cleanliness, and storage of foods; proper cooking of foods, particularly of vegetables. Suitable material for upper elementary or junior high school hygiene. May also be of interest to home economics classes.

**Oh! Say Can You See** (Zurich, sd, 15 min). Opens with cartoon of "eye injury gremlins." Stresses importance of sight. Comparison of eye and camera; operation explained. Common symptoms of eye defects indicated. Explanation of farsightedness, nearsightedness, astigmatism, and cross-eyedness—effect of each on vision shown. Methods of correction presented. Effects of defective vision outlined. Protection methods given. "Eye injury gremlins" protest, indicating that employees won't heed warnings or use safety devices. Rules for better vision discussed. Indicates carelessness and neglect as major causes of eye accidents. Much information for one class session, but should be useful in high school or college classes in hygiene, foremanship, industrial management, and vocational courses.

**Our Health Is in Your Hands Series** (Castle, made by U. S. Public Health, sd, about 15 min each). Designed for use in teaching sanitation to personnel in eating and drinking establishments. The material covers reasons for sanitation measures, personal cleanliness and health, food handling and storage, proper care of dishes, etc. Suitable for industry and restaurant-personnel training, home economics classes, school-cafeteria personnel, hygiene classes. The filmstrips consist of photographs and some cartoons or drawings. Individual titles are listed below with brief descriptions.

**Germes Take Pot Luck** (No. PH-1, 76 frames). How germs cause disease; how disease may be spread (particularly in restaurants); how restaurant employees can protect public health. Indicates such proper sanitation practices as employees' personal cleanliness and proper handling of foods and of dishes. Presents germ dangers from sneezes, rats or mice, and insect pests.

**Service with a Smile** (No. PH-2, 63 frames). Need for attention to personal health by restaurant employees, ways to keep well, and safe practices in serving food. Both good and bad examples in personal cleanliness and in handling of food.

**In Hot Water** (No. PH-3, 75 frames). Proper methods of washing, handling, and storing dishes. Step-by-step procedure in hand dishwashing. Operation of single-tank dishwashing machine. Also indicates unsanitary practices.

**Safe Food for Good Health** (No. PH-4, 81 frames). Methods and procedures for safe buying, safe preparation, safe serving of food, and protection of food from contamination. Ends with summary of main principles presented in the entire series.

**Primary Health** (Young America, 6 filmstrips, si, 30—45 frames each, teacher's guide). This recently produced health series for primary grades provides good motivation for development of proper health habits. Two children, Jim and Jane, are used to present healthful activities as a normal part of living, without presenting the rules as categorical "musts." The series stresses growth, strength, and feeling well as reasons for abiding by health rules. Simple drawings with brief captions visualize the activities clearly and interestingly, providing easily retained visual images. Questions and suggestions for pupil participation are included and each strip ends with a pictorial quiz. Individual titles are listed below with brief descriptions.

**Keeping Clean** (36 frames). In the morning: washing hands, face, neck, and ears; proper method of brushing teeth; brushing and combing hair. Summary as children go to school. Play gets hands dirty—wash before supper. Bathing; washing hair; need for girls to brush hair frequently. Cleanliness at bedtime.

**Strong Teeth** (36 frames). Jim and Jane visit the dentist—reasons given. Dentist removes baby tooth so that second tooth has room to grow, fills cavity. Care of teeth indicated: proper foods, don't eat too much candy or chew on very hard things, cleaning, visiting dentist twice yearly.

**Foods for Health** (40 frames). Jim and Jane on grandfather's farm write letter home telling of the good foods they eat that make them grow strong, and also indicate other healthful activities, such as daily breakfasts, wearing sunsuits while working in the garden, drinking water, drinking milk frequently, supper and lunch foods. Root vegetables and green leafy vegetables listed. Indicates farm sources of many of the foods. Points out that foods liked by animals are often those that are good for children too.

**Rest and Sleep** (34 frames). Need for sleep and rest for growth. Types of foods needed for growth. The bed—straight, flat, hard, clean, light blankets. Sleep rules: 12 hours of sleep, open windows, thin pillow, keep head uncovered, spine straight.

**Keeping Well** (32 frames). Jim hurts knee at recess; school nurse cleans and bandages it. Germs in dirt; types of germs causing colds, ways in which spread. Covering sneezes or coughs. Flies as germ carriers. Ways of keeping germs from hurting you and other people: staying home when ill; vaccina-



tion; not playing with sick children; cleanliness; proper foods; rest and sleep; outdoor play.

**Straight and Tall** (39 frames). Opens with suggestion that children run hands up and down back to locate spine and muscles; indicates that spine should be straight and muscles strong. Examples of good and bad posture, standing and sitting. Helping the bones and muscles: foods, outdoor exercise; proper shoes; correct walking habits; rest and sleep. Stresses standing and sitting tall.

**Reproductive System and Human Development** (Eye Gate, si, 102 frames). Photographs and diagrams showing female reproductive organs, purpose of each stated. Ovulation defined. Diagrams showing fertilization of ovum, process within ovum, segmentation in fertilized ovum, division into cells, implantation in uterus, growth and maturation of embryo and fetus, various stages of fetal development. Last frame indicates development after birth—infancy, childhood, adolescence, and maturity. Diagrams of fertilization and development of ovum show many stages and may be projected rapidly. Suitable for senior high school biology or physiology classes or for first-year biology or physiology in college. Diagrams are clear and present processes in some detail.

**Respiratory System** (Eye Gate, si, 46 frames). Statement of function. Diagrams showing location of organs. Diagrams and photographs of lungs, diaphragm, process of inhalation and exhalation. Importance of fresh air and sunshine. Suitable subject matter for high school physiology classes. Diagrams are legible and show process clearly.

**Safe Water** (U. S. Public Health, sd, 15 min, loan). Methods of protecting water supply. Opens with sequence showing rainstorm as source of all drinking water. Story of impure water in rural school well and resultant epidemic of typhoid. Discussion of city water supplies: how cities safeguard water; possibilities of contamination; departments often needing more money or personnel; need for public to get behind their needs. Rural water supplies: examples of unsanitary equipment and locations; explanation of proper equipment and location; need to consult with local health department. Danger signs for poor sources listed. Good explanation of protection methods. Suitable for senior high school or college classes in hygiene, community health, and farm management.

**The Science of Seeing** (GE, si, 34 frames, lecture notes, loan). Discusses importance of good sight and unnatural burden modern living conditions place on the eyes; causes of poor eyesight, suggestions for easing the strain of long, close work; advantages of improved illumination. Important elements in seeing—the eye, the task, and the light. Graphs showing increase of eye defects with advancing age groups. Four factors in seeing—size of object, contrast, time, and

illumination. Good material for high school hygiene classes and may interest physics or general science classes studying light, as supplementary material. Lecture notes are long but information is required, since captions and text are not used in the film.

**See for Yourself** (Nat'l Better Light Better Sight, sd, 105 frames, 15 min). Discussion of the relationship of light and sight, indicating why the home needs better lighting, demonstrating proper and improper lighting conditions, and emphasizing the right lighting for particular seeing tasks. Introductory sequence presents individual light needs for the Smith family. Second sequence presents a brief history of development of the science of lighting, indicating that there is still little improvement in proper use of light. Discussion of different lighting requirements of different seeing tasks. Complexity of eye mechanisms and amount of work done by eyes indicated. Effects of better lighting listed. Very good material for high school or college health classes, but much information for one class session. May also interest home economic classes as supplementary material.

**Story of Helen Keller** (Better Vision, sd, 100 frames, 30 min, loan). Story of the life of Helen Keller from her birth as a normal baby through her training and education, narrated by Lisa Sergio. Information on teaching methods used, use of Braille, lip reading, hand spelling; various activities of Miss Keller; a short recording of Miss Keller's speech. Ends with sequence on importance of sight conservation. Commentary good but very long; many of the pictorial frames are held long on the screen. Many static pictures, such as portraits. May be of interest as supplementary material in high school classes.

**Stung! By Amos Quito** (Eye Gate, si, 67 frames). Typical breeding places. Life cycle of anopheles. Comparison of male and female. How to recognize the female anopheles. Diagram showing what occurs in the blood when malaria parasites are injected. Control methods listed and illustrated. Suitable for high school hygiene or biology classes. "How Mosquito Spreads Disease" provides more information on the two life cycles of the parasite. This strip gives more information on control methods.

**Swat That Fly** (Eye Gate, si, 82 frames). Life cycle of blowfly. Views of feet and mouth parts. Experiments showing strength and energy of fly. Fly conveying disease from putrid meat to sugar, which is then eaten. Control methods indicated, including natural enemies. Sequence on life cycle good. Does not illustrate method of disease transmission as well as "The Fly as a Disease Carrier." Suitable for high school use.

**Two Precious Pilots** (Westinghouse, sd, 12 min, booklet, loan). The eyes and their need for good artificial light. Opens with comparison of eyes to two pilots



which guide our minds and bodies. Indicates airline's good care of their pilots and need for use to care as well for our "pilots." Abuse given eyes; effects of strain. Eye and camera compared, including requirements of both for proper lighting. Rules for proper use of eyes in play or study indoors. Material same as that in "The Magic Camera" described above, but uses different comparisons. Vocabulary and information suitable for junior high school or upper elementary classes. Good pictorial material; some frames held long on screen. Uses "dog gone it" once in narration.

**X ray on Teeth** (Eye Gate, si, 27 frames). Infected teeth as source of many chronic diseases; importance of X ray of teeth to locate the trouble. Photographs showing X rays being taken. X-ray photographs of various infected teeth with statement of disease caused by each. Good information on importance and function of X rays of teeth. However, clothing of individuals and equipment date the film.

**Your Teeth and Your Health** (American Dental, si, 42 frames, manual, loan). Examples of good and poor teeth, showing effect on appearance and indicating ailments that may result from tooth decay. Rules for proper dental care discussed. Composition and structure of teeth presented. Development of decay shown. Suitable for upper elementary grades. Not usable without information of type provided in manual, since pictorial frames contain no captions or text.

See also the following individual titles for supplementary or related material:

Inspection and Distribution of Milk

Inspection of Food Products

Open for Infection

## DISEASES

**Design for Health** (Nat'l TB Assoc., si, 50 frames, loan). Designed for showing in conjunction with the motion picture "Lease On Life," but can be shown separately if desired. Stresses importance of periodic examinations. Opens with introduction to Jones family who look healthy, and asks question "But—are they?" Indicates precautions for good health, discussing each: examinations; birth certificates; proper diet; immunization; school health programs; care of teeth; ear examinations; need for examination to identify cancer during curable stages; industry programs for employee health. Tuberculosis: how you catch TB; "allies of TB" such as poor housing, overcrowding, poor diet, fatigue, tests; how long before you feel sick; symptoms; cures. Subject matter suitable for senior high school or college health or hygiene classes; may also interest classes in child care. Much information presented in form of questions for group participation.

**Endocarditis and Valvular Disease** (Eye Gate, si, 137 frames). Drawings and microscopic photographs of various stages and types of endocarditis and valvular diseases, showing effect on heart, kidneys, mucous membranes, etc. Typical effects and symptoms pointed out. Technical in nature; possibly of interest to medical schools as illustrative material.



From filmstrip "TB Facts." (National Tuberculosis Association. Photo by Emerson Yorke Studio.)

**Malaria** (U. S. Public Health, sd, 15 min, loan). Discussion of causes and spread of malaria, effects of disease, and prevention methods. Told in story form. Southern farmer and family during evening rest—"dangertime of day"—small girl and brother get malaria. Strip points out how disease was transmitted, breeding places of anopheles, results of malaria on victims and their land and homes. Proper treatment by doctor indicated. Prevention stressed: mosquito netting, screening, spraying; community responsibility in cleaning up breeding areas. Economic costs of disease emphasized, indicating that cost of screening is less than that of disease. Suggests getting aid from health officer. Somewhat long, containing much information, but stress on economic aspects is very good, as are the suggestions for simple preventive measures. Suitable for senior high school,



college, or adult groups. May interest some agricultural classes particularly in the South as supplementary material.

**Rickets** (Eye Gate, si, 75 frames). Extent of rickets; effects shown by photographs of children with slight and with serious rickets; major symptoms; causes; X rays showing what happens to the bones; importance of early detection; treatment as given at Children's Bureau Clinic; effects of treatments; importance of sunlight in child care. Subject matter and treatment suitable for senior high school or college classes in hygiene or child care. Somewhat long, but many photographs of affected children which may be shown rapidly. A few photographs show outdated clothing, hairdress, and infant's carriages.

**TB Facts** (Nat'l TB Assoc., si, 36 frames, guide). Part of a unit that also contains motion picture "This is TB" and audience guide "You Can Beat TB"—both designed to give essential facts on tuberculosis. Filmstrip is divided into five sections, as indicated below, with pertinent facts on each given clearly and briefly: What is TB?—description of disease. What Causes TB?—the germ, effects on body tissue, symptoms. How Do You Get TB?; How TB Can Be Found and Cured—texts, X rays, treatment, readjustment. How You Can Avoid TB—extent in United States, need for examinations and X rays, prevention methods. Suitable subject matter and treatment for senior high school, college, and adult groups. May also interest classes in child care. A good summary of facts about tuberculosis.

### FIRST AID

**Film Aid to First Aid** (SVE, 7 films, si, manuals). Good general pictorial material on the basic principles of first aid. Information of the type supplied in the manuals is required, since the filmstrips do not contain either captions or text frames. The subject matter and treatment is suitable for upper elementary or high school classes. This series may also be of interest to clubs such as scout groups. Individual titles are listed below with brief descriptions.

**Artificial Respiration and Its Uses** (25 frames). Diagrams of breathing apparatus, of position of patient showing location of breathing organs. Photographs showing resuscitation method and change from one operator to another; use of pulmotor illustrated. Stresses position, pressure, and timing.

**Bandaging** (2 parts, 26 frames each). Bandages and materials used in first aid; methods of folding and applying various types of bandages; methods of securing each type. Photographs show application method—each preceded by caption naming type of bandage being applied.

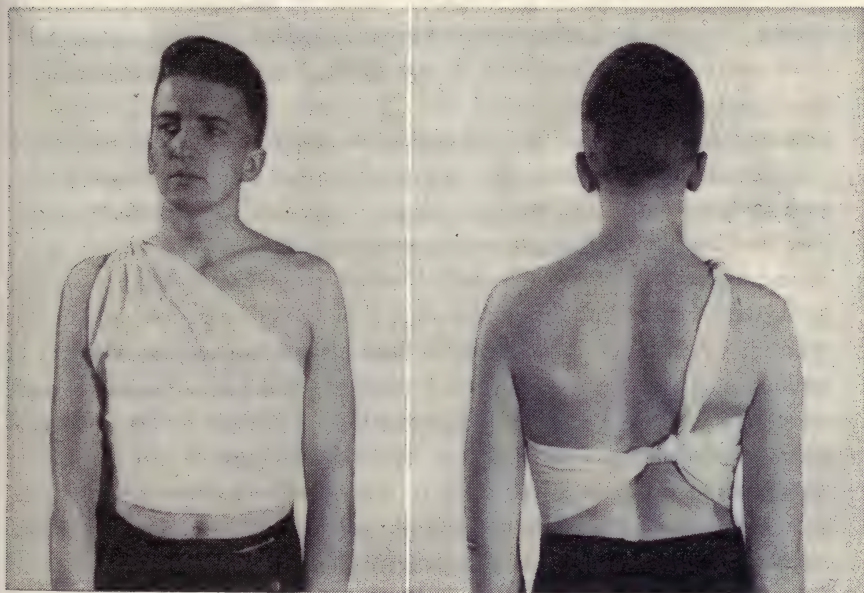
**Control of Bleeding** (30 frames). Pressure spots indicated on diagram; parts of heart, amount of blood in normal body; effects of various amounts of blood loss. Photographs and diagrams showing location of pressure spots and

application of pressure, types of tourniquets and application, bandaging, treating nosebleed.

**Fractures** (34 frames). Treatment for various types of fractures, use of temporary splints and slings; use of stretcher.

**Transportation of the Injured** (46 frames). Various "carries," stretcher, improvised stretchers, placement in truck or automobile, use of chair.

**Wounds** (30 frames). Types and causes of wounds and scratches, need for treatment of even small scratches; types of disinfectant; application and bandaging; treatment of snake bite; particles in eye.



From filmstrip "Dressings and Bandages." (*Jam Handy Organization.*)

**First Aid Training Kit** (Jam Handy, 19 filmstrips, sd and si, black and white and color, manual, about 15 min each. This series is designed to teach first-aid techniques in a step-by-step procedure. Each filmstrip may be shown either with the recorded lecture for overview purposes, or without the record for detailed examination and explanation of specific techniques. Subject matter and treatment suitable for any classes or groups in which first aid is being taught from junior high school through college. Strips No. 2 and 3 may also interest physiology or anatomy classes. Individual titles are listed below with brief descriptions.

**The Purpose of First Aid** (No. 1, 51 frames). Preview of the course and some of its applications, illustrated by handling of victims in various types of accidents.



**The Body** (Part I, No. 2, 43 frames, color). Stresses necessity to know body in order to be able to repair it. Contains photographs and diagrams of major muscles, tendons, skin, blood, trunk, upper and lower limbs, major bones and joints.

**The Body** (Part II, No. 3, 46 frames, color). Diagrams showing heart, arteries, veins, capillaries, respiratory system, digestive system, and nervous system. Also includes location of pressure spots for use in stopping bleeding.

**Shock** (No. 4, 26 frames). Defines shock and describes symptoms and causes. Methods of treating victims of shock demonstrated.

**Unconsciousness** (No. 5, 59 frames). Causes of unconsciousness including hysteria, fainting, heat exhaustion, sunstroke, apoplexy, epilepsy, carbon monoxide poisoning, drowning, and electric shock. First-aid treatment for each type given.

**Common Emergencies** (No. 6, 58 frames). Several common conditions which may require first-aid treatment: appendicitis, choking, nosebleed, earache, toothache, common colds, sunburn, poison ivy, poison oak and sumac, insect bites, and fainting. Methods of treating each demonstrated.

**Minor Injuries** (No. 7, 65 frames). Correct treatment of sprains, strains, dislocations, bruises, frostbite, and foreign bodies in eye, ear, nose, and throat.

**Wounds** (Part I, No. 8, 50 frames). Principles of first aid for all types of wounds: stop severe bleeding; treat shock; prevent infection. Indicates methods of stopping bleeding, including use of the six pressure points and use of tourniquet. Methods of cleaning and sterilizing wounds.

**Wounds** (Part II, No. 9, 47 frames). Treatment of abrasions, clean cuts, lacerated wounds, deep puncture wounds, animal bites, snake bites, internal bleeding.

**Dressings and Bandages** (Part I, No. 10, 47 frames). Materials used in bandaging wounds; proper handling of bandages; correct application.

**Dressings and Bandages** (Part II, No. 11, 42 frames). Commonly used bandages including triangular, cravat, four-tailed, roller gauze. Indicates correct application on various parts of the body and for various types of injury.

**Artificial Respiration** (No. 12, 33 frames). Correct procedures in application of artificial respiration by Schafer prone-pressure method. Indicates accidents that may require such treatment. Includes common tests used to determine whether victim is living.

**Burns** (No. 13, 38 frames). Correct treatment of burns and scalds of various types and degrees. Steps in treatment and preparations which may be used. Treatment of burns by acids or alkalies and chemical burns of the eye also.

**Poison** (No. 14, 35 frames). Treatment of drug poisoning, food poisoning, and carbon monoxide poisoning. Symptoms of each described.

**Fractures (Types)** (No. 15, 54 frames). The two principal types of fractures. General first-aid treatment for all types of fractures. Specific treatment for fractures of leg, forearm, upper arm, elbow, finger, and collarbone.

**Fractures (Treatment)** (No. 16, 55 frames). First-aid treatment of fractures of skull, nose, jaw, spine, ribs, pelvis, thigh, kneecap, and toes.

**Fractures (Splints)** (No. 17, 64 frames). Use of traction splints, both prepared and improvised, for arm and leg fractures.

**Moving the Injured (Stretchers)** (No. 18, 41 frames). Methods of moving the injured on various types of stretchers. Indicates precautions in moving persons with back and neck injuries.

**Moving the Injured (Carrying)** (No. 19, 54 frames). Methods of improvising stretchers. Common types of "carries" for use when stretcher cannot be made quickly, including three-man, two-man, chair litter, fore-and-aft, fireman's carry, and packstrap. Assisting injured person to walk. Methods of placing injured person into automobile or truck.

## GENERAL

**Health Heroes Series** (Metropolitan Life, 7 films, si, loan). Biographical material (such as birthplace and date, early interests, education, etc.) on the person indicated in the individual titles, major contributions to health, and importance of these achievements. The information provided is excellent but the strips contain much text and visualization of ideas presented is not complete. Subject matter is suitable for upper elementary and junior high school health or hygiene classes, and may also interest social studies or history classes as supplementary material. Some general science classes may find the material suitable also. Individual titles are listed below. Descriptions are not provided since the titles are self-explanatory.

**Edward Livingston Trudeau and The Crusade Against Tuberculosis** (66 frames).

**Edward Jenner and The Story of Smallpox Vaccination** (72 frames).

**Madame Curie and The Story of Radium** (66 frames).

**Louis Pasteur and The Germ Theory of Infection** (55 frames).

**Walter Reed and The Conquest of Yellow Fever** (56 frames).

**Florence Nightingale and The Founding of Professional Nursing** (72 frames).

**Robert Koch and The Discovery of the Tubercle Bacillus** (50 frames).



**Healthy, Wealthy and Wise** (Brandon, sd, about 14 min, color). Explanation of the benefits of group health-insurance plans in industry, presented by cartoons. Opens with patient in hospital frantically figuring costs of operation, effect of worry on his recovery. Tells problems to fellow patient who explains his lack of similar problems on account of his group prepaid health plan. Ends with first patient promoting such a plan in his own office with representative of insurance company explaining it to members of the staff.

Good cartoon presentation of health-insurance plans. May interest senior high school or college health or hygiene classes. Groups studying industrial management and labor problems may find this of interest as supplementary material.

**Patent Medicines—Old and New** (Nostrum Evil and Quackery) (AMA, si, 68 frames). Mainly long text frames, with reproductions of labels and advertisements. Discusses importance of Federal Food, Drug, and Cosmetic Act of 1938. Shows reforms under Foods and Drugs Act of 1906. Shows why claims by nostrums were erroneous. Specific discussion of cancer cures, of consumption cures. Indicates that consumer should inquire of physician concerning patent medicine he is not sure about and thus avail himself of protection offered by government under act of 1938.

Although mainly text frames, which are very legible, it provides very good information on this subject. The treatment and subject matter is suitable for senior high school and college government, health, or hygiene classes.

## NURSING AND RELATED SUBJECTS

**The Nurse's Responsibility in Saving Sight** (Nat'l Soc. for Prevention of Blindness, sd, 20 min, 120 frames, loan). Eye health from prenatal life to old age and contributions of nurses in sight-saving measures. Includes discussions of prenatal care; care and protection of infant's eyes; how we see; defects and their effects; correction methods; importance of eye examinations; symptoms of possible eye faults; need for proper lighting; eye injury first aid; eye disease affecting normal field of vision; cataracts. Very long and much information for one class session but may be shown in sequences if desired. Good material for senior high school and college hygiene classes or for teacher training groups. May interest home economics, child care, or nursing classes as supplementary material.

**Nursing Series** (Castle, made by USOE, 14 films, si, manuals). Designed for showing in conjunction with motion pictures of the same titles, but may be used independently for review purposes or as discussion guides. Photographs and other pictorial material with questions for group discussion. The series is particularly adapted for nurse's training. However, the subject matter contained

in films No. 403, 404, 406, 412, and 414 may interest senior high school or college classes such as home economics, home nursing, and child care. Individual titles are listed below with brief descriptions.

**Bathing the Patient (Home Care) (No. OE 403).** Preparation of equipment; bathing the arms, legs, and body; giving back massage and alcohol rub; brushing patient's teeth; shaving the patient.

**Feeding the Patient (No. OE 404).** Factors affecting appetite and digestion of patient; preparation of environment and patient for meal; arrangement of tray; nutritional needs and preferences considered in feeding care; procedures in feeding recumbent and convalescent patient; factors in after care.

**The Vital Signs and Their Inter-Relation—Body Temperature, Pulse, Respiration, Blood Pressure (No. OE 406).** Physiology of respiratory, heat regulatory, and circulatory systems; their interrelation in normal functions and in deviations; how to ascertain and record vital signs; importance of accurate observations; taking care of equipment.

**Hydrotherapy (No. OE 410).** Administering sedative baths and wet-sheet packs; tonic showers, douches, sprays; special types of therapeutic baths, Hubbard bath, and rehabilitation pool; physiological effects on body.

**Radiotherapy: High Dosage Treatment (No. OE 411).** Nature of X rays; varying degrees of penetration of low- and high-voltage rays; effect on human tissue; how nurse technician prepares patient and administers X-ray treatment; how radon seeds are sterilized and implanted in diseased tissue.

**Recreational and Occupational Therapy (No. OE 415).** Activities fitted to patient's condition; passive diversion during immobile state following traumatic injury; limited physical activities in bed; individualized occupational therapy; group occupational work in hospital and community; social recreation projects.

**Teaching Crutch Walking (No. OE 422).** How physical therapist teaches bed patient reconditioning exercises; how to teach patient to walk in walker; teaching various methods of crutch walking; sitting, standing, climbing stairs; safety factors.

**Therapeutic Uses of Heat and Cold: Part I: Administering Hot Applications (No. OE 408).** Nature of heat; how it is transferred by conduction, conversion, and convection; body reactions to heat and use of reactions in alleviation of pain. Applying hot-water bottles, electric pads, chemical pads, paraffin bath. Use of hot soak, compresses, infrared lamp, and short-wave diathermy. Precautions when applying heat.

**Therapeutic Uses of Heat and Cold: Part II: Administering Cold Applications (No. OE 409).** Body's response to cold stimuli; how these responses



are used to alleviate pain. Administering contrast baths, ice bags, ice packs as anesthesia; using refrigerating blankets and cold chamber.

**Fundamentals of Massage** (No. OE 414). Proper positions of patient for massage; performing superficial and deep stroking; importance of rhythm; how to knead, perform friction; value of each type of movement.

**Care of the New-Born Baby** (No. OE 412). Nurse's functions and duties in teaching parents to care for new-born babies; what nurse can do in home, clinic, and hospital; demonstrations of holding, dressing, bathing, and feeding baby.

**Care of the Cardiac Patient** (No. OE 419). Nursing care given cardiac patients; comfort, rest, sleep, diet and feeding, elimination, cleanliness, diversional and occupational therapy.

**Care of Patient with Diabetes Mellitus (Uncomplicated)** (No. OE 417). Symptoms of diabetes; role of nurse in diagnostic procedure; how nurse teaches patient to administer insulin injections; teaching patient to regulate diet and make Benedict test for sugar in urine.

**Care of Patient with Diabetes Mellitus (Complicated)** (No. OE 418). Nurse's role in diagnosis and treatment of coma and insulin shock; nurse, doctor, dietitian, and psychiatrist in assisting patient to develop healthy mental attitude toward condition.

**Rural Public Health** (ACE, No. 15, si, 49 frames, lecture notes). Résumé of work performed by county health department: inspector of sanitation—checking cleanliness at creamery, school health inspections, quarantine. Public health nurse—teaching in schools and adult classes, services performed during home visits. Suitable subject matter and treatment for senior high school and college classes. May also interest sociology and government classes as supplementary material.

**Urban Clinic** (ACE, No. 14, si, 50 frames, lecture notes). Stresses importance and services of health clinics, showing various aspects of their services and activities. Points out need for continued health education and preventive medicine. Suitable subject matter and treatment for senior high school, college, or adult groups. May also interest sociology and government classes as supplementary material.

See also Registered Nurse for supplementary or related material.

# Social Sciences

If precise terminology is required, neither Social Sciences nor the more elementary Social Studies provides an accurate heading for the filmstrips included in this section. Much of the material is of elementary level in subject matter and treatment, thus being unsuitable for classification as social science; and this same material fails to show interrelationships (such as those between geography and history or economics) and often disregards the human factor, thus being unsuited for classification as social studies. However, all the strips described treat of subject matter related to the social sciences and/or studies, even though the approach is not always that which might be most desirable.

One of the most difficult aspects of the social sciences to present is their relation to the problems of the individual. Such an identification has sometimes been achieved in feature-length motion pictures such as "The Grapes of Wrath" and "How Green Was My Valley." Today's instructional films and filmstrips have not yet perfected the technique of identifying broad social problems with the individual. There has been a tendency to concentrate on facts independent of their human significance. One way in which filmstrips can be used to attack this problem is if strips are made from the feature-length motion pictures that dramatize social issues. Such strips could then be profitably used in the classroom following an auditorium showing of the feature.

Another valuable use of filmstrips in social studies is to use them as a storytelling medium. Although this is possible with live actors, strips made in this manner have the appearance of a "poor man's movie." Therefore the ideal treatment may be by cartoons, which can be presented in a form similar in student attraction to the comic strip with a higher caliber of art work, story, and captions.

Over and above these undeveloped methods of approach, there is an opportunity to present facts and statistics in a manner easier to assimilate and more palatable to the student. The use of visual symbols such as those commonly employed by leading newspapers might be very helpful in the classroom. The filmstrip provides a medium for reproducing such graphic material more efficiently than the use of tear sheets or the more expensive and cumbersome printed charts. Filmstrips may also be used to present maps that are changing so frequently that the investment in up-to-date conventional wall maps is difficult for the average school.



Unfortunately, the majority of strips described in this section can be used for nothing more than supplementary material. In spite of the large number of filmstrips listed, the social science teacher may be disappointed upon reading their descriptions to find in many instances (except in the case of elementary school geography) that there are not enough filmstrips in his or her field to justify the acquisition of a projector. However, some of the newer releases point the way to a more effective filmstrip treatment of social science topics.

## ARCHAEOLOGY AND ANTHROPOLOGY



From filmstrip "Excavations at Seneferu's Pyramid," produced by The University Museum of Philadelphia. (*Society for Visual Education*.)

The following sets of filmstrips were all prepared by the University Museum of Philadelphia and are available from the Society for Visual Education. The pictorial material consists of photographs of artifacts of the region or era designated by the individual titles, some reconstructions, diagrams, maps, and models. Long text frames provide identification of the material shown and explain its significance. The vocabulary is advanced. Although the text material is lengthy in comparison to the pictorial content, these strips may be of interest as illustrative material for high school

or college classes in anthropology, archaeology, and ancient history. Several may also interest classes in the history of art. These films will probably be most useful in those schools unable to reach a museum. Individual titles with brief descriptions follow, arranged by sets. One set, "Development of Man," has been described under the section on world history.

### **Africa (3 filmstrips).**

**The People of the Congo** (48 frames). Various tribes of the Congo area, showing appearance of people, clothing, decorations, homes, tools, weapons, food, dances, etc.

**Peoples of North Africa** (49 frames). Various peoples of North Africa; appearance, homes, government, occupations, towns, and villages. Map shows location of each group. Includes Berbers, Tuareg, Arabs, Egyptians—fellahin, Copts, Nubians, Beja—and Abyssinians.

**Life of the Pygmies** (47 frames). Appearance, physical characteristics, villages, homes, hunting, occupations, government, trading, marriage customs, etc.

**Babylonia** (1 filmstrip).

**Babylonia in the Time of Nebuchadnezzar** (70 frames). Map of Babylonia about 605 B.C.; artifacts of period, brief historical data; writing; building, architectural characteristics and peculiarities; Code of Hammurabi; medical practices; collapse of culture. Many views of buildings, both ruins and reconstructions.

**Central and South America** (5 filmstrips).

**The Ancient Civilization of Peru** (66 frames). Artifacts and text data on Inca civilization, megalithic culture, culture of Chimu, Nazca culture; rise of the Incas and high points of their culture; present descendants and their economic status.

**Natives of South America: Arawak and Carib Tribes** (48 frames). Life and customs of agricultural tribes of the savannah region up the Amazon and Branco rivers.

**Natives of Mexico and Central America** (66 frames). The Indian groups, languages, percentage of Indian population, status of minority groups of whites. Survey of present-day Indian cultures; the Seri, Yaqui-Tarahumare; Huichol, descendants of Mayans and of Aztecs. Maps show locations of each group.

**Excavating a Maya City: Piedras Negras** (65 frames). Map of location; probable dates of construction. Views of archaeologists' camp, of work of excavation, remains of structures found, packing and transporting findings.

**Conquest of Mexico and Peru** (54 frames). The story of Spanish conquest of Mexico and Peru beginning with 1517; tales of great wealth. Includes the following: Cortez expedition; views of Aztec culture; treatment of Montezuma; Balboa's expedition; Pizarro in Peru and death of Atahualpa. Also suitable for American history classes.

**China and Japan** (3 filmstrips).

**Early Chinese Civilization** (54 frames). Reconstruction of life in ancient China through remains turned up by plows and by excavations of mounds over emperor's graves. Includes examples of early art (about 600 B.C.); development of more vigorous forms by 400 B.C.; other artifacts; text explains how tomb artifacts show beliefs and customs.

**China Today** (77 frames). Geographical data; types of people; physical characteristics as differing with different areas; differences in manners and customs, occupations; need for hard work and the constant threat of famine. No



indication of more modern developments or of industrialization; all prior to the Second World War.

**Japan Today** (65 frames). Geographical data; information about early inhabitants, the Ainus; physical characteristics of Japanese; adoption of Western customs; native customs retained; foods; occupations; progressiveness; regard for past and preservation of places of worship. Information as prior to the Second World War.

### **Egypt (5 filmstrips).**

**Excavating Seneferu's Pyramid** (52 frames). Work of the Coxe Expedition at Medum; model of pyramid; reconstructions; appearance of pyramid during excavations.

**Egypt in the Time of the Exodus** (53 frames). Interpretations of archaeological findings showing life of Egypt in the thirteenth century B.C.

**The Egyptian Mummy** (43 frames). Reasons for mummifying; indications of methods used; views of various types of mummies; mummy cases, use of scarab; Canopic jars.

**Life in Ancient Egypt** (55 frames). Aspects of life in ancient Egypt that are similar to conditions today: agriculture, irrigation, feluccas, etc. Details of life as shown in tomb wall paintings.

**Pyramids of Egypt** (49 frames). Location of pyramids other than the Great Pyramids at Giza; work and findings of archaeologists. Diagrams of prehistoric tombs. Development of mastaba. Views of Seneferu's pyramid and pyramids at Giza—construction, excavation methods, state of preservation.

### **Greece (4 filmstrips).**

**Early Civilization of Crete** (63 frames). Location; importance in early Mediterranean travel; present inhabitants; remains showing evidences of early culture including Minoan village, Knossos palace, fortifications, pottery, and other artifacts.

**Greek Life** (75 frames). Customs, occupations, buildings, etc., of Greece about 555 B.C.

**Greek Games** (58 frames). Greek sports as shown by frescoes, vase paintings, and excavations of buildings. The Olympic Games about 766 B.C. Purposes of games.

**History of Coinage** (51 frames). Early barter methods; use of gold or silver rings about 500 B.C.; Lydian metal coins of 700 B.C.; coinage of Croesus; early Greek and Roman coins; development of reverse designs, coin dies, use of religious symbols, of king's portraits, commemorative coins, metals used.

**North America (5 filmstrips).**

**Prehistoric Man in North America** (70 frames). Theory of emigrations to America; relationship of present-day Indians to natives of Asia. Remains of early man and their significance. Cultures revealed by shell mound findings. Development of pottery, of maize, of architecture. Cultures of Mound Builders, of pre-Columbian groups, Basket Makers, cliff dwellers, Pueblos.

**Life of the Plains Indians** (64 frames). Map showing location of common culture area; different tribes and languages with same culture pattern. Examples and information on culture ending with some material on present-day Plains tribes.

**Life of the Pueblo Indians** (59 frames). Map and description of region; major points of Pueblo culture pattern with explanation of effect of climate and region. Ancient and modern cultures compared.

**Indians of the Eastern Woodlands** (61 frames). Map of area; location of the two great linguistic groups, the Algonquin and Iroquoian. Description of the Five Nations and their culture pattern. Customs and life of present-day tribes.

**Life of the Eskimo** (49 frames). Theories of origin; map of area occupied. Information of customs, religion, and mode of life. Vocabulary simpler than that in other strips in these series.

**Palestine (3 filmstrips).** May also interest church groups.

**Excavations at Beisan, The Biblical Beth-shan** (68 frames). Excavations, remains, and artifacts; some reconstructions; explanations of significance.

**The Four Canaanite Temples at Beth-shan** (76 frames). Theory of establishment; remains uncovered and interpretation of remains and artifacts. Diagrams showing arrangement of temples. Reconstructions.

**The Ancient Biblical Cities of Palestine** (62 frames). Map, excavations, remains and reconstructions of the following, with interpretation of facts found: Dothan, Lachish, Bethshean, Jerusalem, Gezer, Jericho, Samaria, Gibeon, Gath, Megiddo, Tanach, Jerash.

**Rome (5 filmstrips).** May also interest Latin classes as supplementary material.

**Roman Life** (52 frames). Ruins beneath present city; work of archaeologists; reconstructions of old buildings; the Forum and its uses; the Sacred Way; theaters; Circus Maximus; Ostia seaport; excavations at Pompeii and mode of life as shown by findings there.

**The Roman World** (69 frames). Debt of modern world to Rome for protection against barbarism and for spread of civilization. Map showing Roman Empire A.D. 400. Evidences of Roman civilization in England, Germany,



France, Arabia, and Dalmatia. Effect of Romans on other cultures. May also interest classes in ancient history.

**Pompeii** (57 frames). Remains as shown in ruins excavated and in reconstructions. Data on life of period.

**Life in the Early Roman Empire** (63 frames). Culture, occupations, customs, and activities of Romans from 27 B.C. to time of Julius Caesar. Some history of the emperors included.

**Early Peoples of Italy** (65 frames). Data on the races in Italy from 2000 B.C. to founding of Rome, including: cave men, Ligurians, lake dwellers, Umbrians, Etruscans. Indicates contributions of early civilizations to that of Rome.

#### **South Seas** (5 filmstrips).

**People of the Philippines** (67 frames). Location of Philippines; brief history; racial stocks. Outstanding culture patterns, physical characteristics and main occupations of Negritos, Moros, Indonesians, and Malaysians; present inhabitants and remaining distinctive features.

**Natives of Hawaii** (66 frames). Location, number, and size of islands. Theories of origins of peoples. History of islands. Culture at time of Cook's visit. Destruction of old culture by influx of other peoples. Deficiencies of primitive culture as contrasted with people's abilities and progress.

**Headhunters of Borneo** (51 frames). The Dyaks, map of area occupied. Characteristics and culture of Dyaks.

**Natives of New Zealand** (64 frames). Location; map; historical data on island. Culture, occupations, and physical characteristics of Maori.

**Australia, Its Natives and Customs** (67 frames). Theories of origin of Australian natives. Physical characteristics, culture patterns, occupations of Tasmanians, of Australian aborigines, the Arunta tribe.

See also the following series and individual titles for supplementary, illustrative, and related materials:

Development of Man Series

Prehistoric Period

Asia

Africa

National Costumes and Types

We Are All Brothers

Ascent of Man

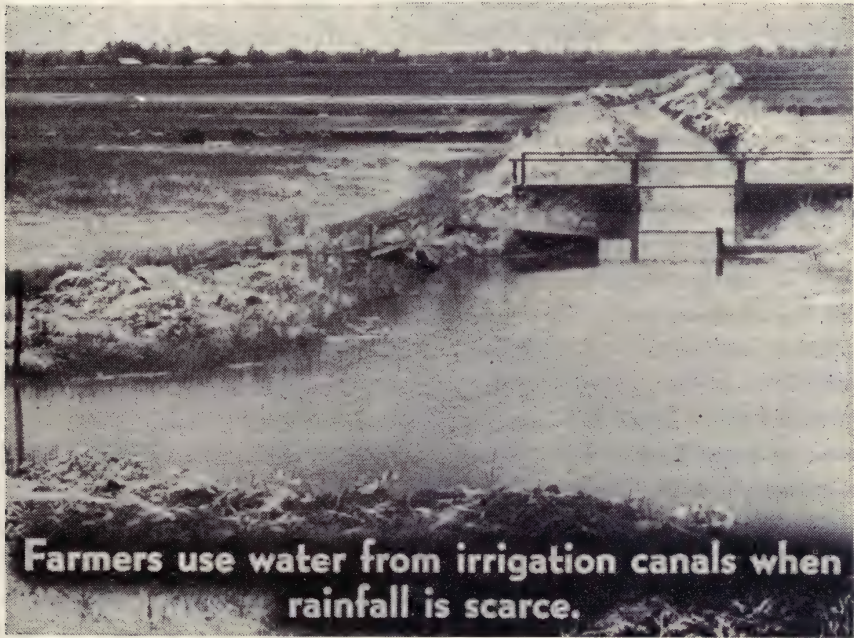
Human Progress

Development of Greek Vase Painting  
History of Arts Series  
Museum Art Series

## GEOGRAPHY

### Regional and Political

Geography is the area in which filmstrips have the greatest contribution to make. It is obvious that an essential prerequisite to the teaching of geography is



**Farmers use water from irrigation canals when rainfall is scarce.**

From filmstrip "Far Western States." (*Encyclopaedia Britannica Films, Inc.*)

the presentation of maps and pictures literally to "bring the world into the classroom." Although this slogan was originally used by a company exclusively concerned with motion pictures, the activities of this firm have been expanded to embrace filmstrips too. This action, together with the increasing interest in still pictures in magazines and other mass media, serves to high light the importance of using pictures from afar to present subject matter dealing with locations outside the vicinity of an individual school.



In order to simplify the selection of filmstrip material, these strips have been divided into three groups: (1) those dealing with regional and political geography, (2) those pertaining to the study of economic geography, and of industries, and (3) those concerned mainly with the general principles or elements of geography.

The filmstrips in groups one and two will frequently be used by the teacher in area study programs, because as Derwent Whittlesey says in "The Earth and the State,"<sup>1</sup> "The character of a state is intimately bound up with the particular earth conditions in which it evolves," as are the economic and industrial activities. It is difficult to imagine how the large selection of filmstrips in geography can be ignored in modern teaching. While it is true that some of the strips are outdated and many of them are nothing but picture-postcard views, particularly of the unique and picturesque, every strip on geography can contribute something to the student's understanding if it is projected quickly enough and the teacher interprets the material for the class.

The value of the existing filmstrips is the greatest in dealing with regional and political geography. In the case of economic and industrial geography, currently available filmstrips tend to present this material in a manner suited only for elementary presentation and are mostly concerned with industries of the United States except for the primitive or unique in other countries. There is much room for new production of economic and industrial geography material suitable for higher grade levels. Principles of geography have not yet been clearly presented in a manner well suited to present-day courses. Although a few strips were produced for the Army Education Program demonstrating the planetary wind system and the earth's vegetation areas, these strips are not currently available for civilian use and no other subjects on similar phases of this field are being distributed.

In spite of the fact that there is opportunity for much new production in geography, many existing materials can be effectively used in spite of their limitations. Filmstrips in this field are principally important for the following purposes:

1. To acquaint students with appearance of physical features, cities, peoples, etc., of other lands and of other areas of their own country.
2. To provide an easy method for pointing out similarities and differences to the local area and its mode of life.
3. To illustrate processes and methods of various industries and to permit comparisons of such industries in different countries.

<sup>1</sup> WHITTLESEY, DERWENT, "The Earth and the State," Henry Holt and Company, Inc., New York, 1943.

4. To aid in indicating relationships, such as that of industry to natural resources and geographical location, of city locations to topography and natural resources, and of climatic conditions to types of clothing and shelter.

## UNITED STATES

**The American Indian** (Eye Gate, si, 110 frames). General survey of various Indian tribes and their present-day mode of life with some data on original life for comparison. Includes material on homes, food, games, handicrafts, etc. Suitable for elementary grades social studies although vocabulary in some instances is advanced. Material well organized for classroom presentation.

**Garden of the Gods** (Eye Gate, si, 52 frames). Photographs of the Garden of the Gods and surrounding country with some historical and geographic data supplied in text frames. Suitable for use as supplementary material in elementary or junior high school classes.

**Indians of the Painted Desert** (Eye Gate, si, 27 frames). Scenes showing the life of Navajo Indians, including photographs of homes, dress, food preparation, and handicrafts. Suitable for use in elementary grades as supplementary material. Filmstrip presents random scenes without giving a complete story on these Indians.

**Indians of the Southwest** (ACE, No. 26, si, 47 frames, lecture notes). A rather complete and well-organized study of the Southwestern Indians, including history of settlement of this area by Spanish, effect on Indians; culture of these tribes; dwellings; mode of life; industries and handicrafts; present-day life and governmental assistance. Suitable for upper elementary or junior high school geography, social studies, and government or civics classes.

**Middle Atlantic States Series** (Eye Gate, 7 films, si). Photographs and text frames providing information on various aspects of these states. In general the text material is lengthy and the photographs tend to be merely "views" adding little to the text information given. The subject matter and vocabulary is of upper elementary or junior high school level. Individual titles and descriptions follow. Dress, automobiles, and some processes shown are outmoded.

**Cities Other than New York** (70 frames). Scenes of various cities near New York where commuters live, and of other cities in area with some data on industries.

**Government and Education** (85 frames). Random scenes of various governmental buildings and educational institutions. Text supplies information identifying each. Nothing of "education" other than location of universities and colleges shown. Scenes of state capitals.



**Historical Landmarks** (86 frames). Views of various historic areas and buildings with long text frames giving historical data, including monuments, battlefields, famous buildings, forts, etc.

**Manufactures** (Parts I, II, and III, 73, 72, and 65 frames, respectively). Part I shows buildings and some processes in industries, such as publications, typewriters, photographic materials, glass, phonograph records, musical instruments. Part II deals with textiles, clothing, wallpaper, carpets, leather goods. Part III shows shipyards, locomotives, electric apparatus, radio equipment. In all three parts cities specializing in each industry are indicated.

**Natural Resources and Some Related Industries** (83 frames). Scenes of areas in which the following resources are found and of industries using each: coal, iron, quarries, salt, clay, fisheries, forests, farms and market gardens, livestock and poultry.

**Physical Features** (79 frames). Photographs and some information concerning the following: coast line; plains, valleys, and mountains; rivers, waterfalls, and lakes. Does not give a unified picture of the region. Much stress on recreational facilities.

**The Most Popular Girl in the World** (Eye Gate, si, 39 frames). Various views of the Statue of Liberty with historical information and architectural sketches. Good strip on this subject. May be of interest as supplementary material in elementary social studies, geography, or history.

**National Parks of the United States** (ACE, si, 46 frames, lecture notes). Photographs of various scenes in the national parks, including maps showing locations. Lecture notes provide information about the parks and activities, such as recreation, museums, informal education, and tours. Statement of purpose of parks. Suitable for elementary or junior high school geography. May be of interest as supplementary material in civics or government classes.

**New England Series** (Eye Gate, 6 films, si). Photographs and text frames providing information on various aspects of these states. In general, the text material is lengthy and the photographs tend to be merely "views," which add little to the text information given. In some cases, the mode of dress, automobiles, and some manufacturing processes shown are outmoded. Subject matter and vocabulary is of upper elementary or junior high school level. Individual titles and descriptions follow.

**Cities, Towns, and Villages** (102 frames). Views of buildings, residences, and streets of various New England cities, towns, and villages. Some data on industries. Mainly scenic in nature, but some good information on relation of cities to each other.

**History, Education and Government** (118 frames). Scenes and text information on various historic buildings, monuments, and areas, of educational institutions, government buildings, and state capitols. Merely scenic in nature, provides little information on history, education, or government. Not well organized, as the three subjects are scattered instead of being grouped together.

**Manufactures** (Parts I and II, 114 frames and 76 frames, respectively). Locations and some views of processes of various industries. Part I opens with effect of water power and harbor facilities on manufacturing in this area. Sequences on textiles, rope, leather products, hats, and shoes. Part II shows electric apparatus, silverware and jewelry, clocks, and watches in some detail. Other industries treated briefly, such as brass goods, rubber, arms and munitions, tools and machines, etc.

**Natural Resources and Some Related Industries** (97 frames). Discussion of following resources and related industries, indicating location of source and of industrial cities: soils and farming; building stone; forests; fisheries; inland waters, and harbors. Major portion concerned with farming. Good, related information.

**Physical Features** (106 frames). Photographs and geographical information on mountains, valleys, and plains; lakes and rivers; coast; climate. Does not include much reference to effect of topography on life or industry in this region; but material is organized in such manner that these effects could be pointed out by instructor or members of class.

**New York City** (ACE, No. 39, si, 53 frames, lecture notes). A very good and complete study of New York City; its history, problems, industries, and mode of life; stressing the city as chief port and financial and transaction center of the United States. Opens with location map—beginnings of New Amsterdam, map of boroughs, population. Reasons for railroads entering New York, interdependence of rail and sea transportation. Wholesale markets. Reasons for being country's clothing industry and style center. Other important industries. Traffic difficulties, reasons. Life in Manhattan, comparison with life in small towns. The foreign populations. Educational and cultural institutions; churches; museums; libraries; parks; the Philharmonic Orchestra. Major streets; stores; cafeterias and restaurants. Food markets and commission markets. Needs of large cities and how they are supplied.

One of the few filmstrips in geography which is more than a picture-postcard view. Indicates geographical and economic reasons, interrelationships, and also deals with the human factor. May be used in conjunction with "Northeastern



Region of the United States" (Panorama of the United States Series). Uncaptioned photographs; lecture notes supply information.

**Niagara the Glorious** (Eye Gate, si, 35 frames). Various scenes of the falls, of the river below the falls, of the gorge, both Canadian and American sides of falls shown. Some good photographs of the falls, but merely scenic in nature.

**Panorama of the United States Series** (ACE, 7 films, si, lecture notes). Uncaptioned photographs showing various aspects of each of the regions. The lecture notes provide information concerning industries, climate, areas and population, etc. Photographic quality in general is very good, although in some instances the pictorial material does not visualize the information provided in the lecture notes for specific frames. Subject matter is general in treatment and suitable for use as introductory material in elementary geography. Major stress is on economic life and industries. Individual titles and brief descriptions follow.

**Overall View** (No. 1, 75 frames). Opens with map of United States followed by shadowed maps showing various areas, with differences in climate indicated by photographs of activities. Main section presents a map of each region followed by random views of industries, cities, etc., with lecture note information on topography, climate, and major industries.

**Northeastern Region** (No. 2, 53 frames).

**Southeastern Region** (No. 3, 57 frames).

**Southwestern Region** (No. 4, 57 frames).

**Far Western Region** (No. 5, 58 frames).

**Northwestern Region** (No. 6, 44 frames).

**Middle States Region** (No. 7, 45 frames).

Each of the above 6 regional films opens with maps of the region followed by scenes of cities, transportation, industries, educational and cultural institutions, natural resources, scenery, etc. Lecture notes provide data on climate, topography, industries, population, mode of life, economic problems, education, recreational facilities, etc.

**Pittsburgh** (ACE, No. 40, si, 49 frames, lecture notes). A good and complete study of Pittsburgh; its history and development, problems, industries, and contributions to the American standard of living. Stresses its importance as an industrial city and relates industrial development to history and geographical location. Indicates growth as transportation center, giving reasons for development. Importance of nearness to raw-material sources. Shows iron and steel industry, oil, glass, food manufacturers (Heinz as example), and electrical industry (Westinghouse as example). Shows cultural and educational institutions, research and experimental institutions, churches, parks, houses, the many steep slopes and use of inclined railways. Problems of smoke control.

One of the few geographical filmstrips which is more than a picture-postcard collection. Stresses reasons for development and interdependence of manufacturing, transportation, and location of raw materials. Can be used in conjunction with "Northeastern Region of the United States" (Panorama of the United States Series). Filmstrip consists of uncaptioned photographs; lecture notes supply information.

**Regional Geography of the United States** (EB Films, 6 filmstrips, si, about 70 frames each). Although designed for use in conjunction with motion pictures of the same titles, these filmstrips are so organized as to be useful independently. Each strip uses many simple, clear maps to show locations of regions, distribution of population, method of settlement, physical and agricultural regions, etc. Relationships between resources and industries are indicated as are relationships between the regions, particularly in trade of products. Most of the strips also include some information on cultural and recreational facilities. The series uses photographs with brief superimposed captions, incorporating many questions for student participation. Each sequence ends with a few review questions; each strip ends with a review and suggestions for further study, reading, or projects. The subject matter and treatment is suitable for upper elementary or junior high school classes. Individual titles are listed below with brief descriptions.

**The Northeastern States** (66 frames). Location; states in this region; physical features; distribution of population; settlement; growth of population. Agricultural products. Fishing. Natural resources. Importance as an industrial region—influx of raw materials from other regions. Transportation. Schools; universities; recreational facilities; research institutions; publishing. Importance of cities.

**The Southeastern States** (66 frames). Location; states in region; settlement; introduction of slavery. Uses of slaves. Early transport. Growth and distribution of population. Importance of agriculture—products. Erosion problems. Cities and their growing industries. Trade with other regions. Progress: use of farm machinery, schools, water power.

**The Middle States** (65 frames). Location; states in region; settlement; population growth and distribution. The agricultural sections—corn and hog belt, hay and dairy belt. Industries based on natural resources. Transportation—region as crossroads of the nation. Trade with other areas. Products this region supplies to the nation. Social and cultural resources; educational institutions; democratic feeling.

**The Southwestern States** (68 frames). Location; states in region; two major natural subregions—the dry plateaus and the plains. Climate; scenic views.



Indians of region, their culture. Spanish influences. Products. Population and its distribution. Irrigation. Important cities. Importance of region in trade and commerce.

**The Northwestern States** (71 frames). Location; states in region; elevation and rainfall; the Missouri River Basin; population distribution; cities. Tourist trade. Transportation; its importance in development of region. Mineral and lumber resources. Agricultural products. Distribution of wheat. Irrigation projects and their importance. Need for importation of manufactured goods from other regions.

**The Far Western States** (71 frames). Location; states in region. Resources. Variety of topography and climate. Seasonal work. Distribution of population. Mineral and oil resources. Lumber production. Agriculture and its variety of products. Irrigation projects. Growth of commerce and industry; importance of harbors and water power. Trade with other regions.

**San Francisco—Mecca of America's West Coast** (Eye Gate, si, 73 frames). Random scenes of the city showing buildings, streets, harbor, residences, etc. Little geographical data. Some photographs showing clothing and automobiles are outdated.

**Towering Wonders of Utah** (Eye Gate, si, 78 frames). Scenes of the mountain areas of Utah and Nevada, entirely scenic in nature with little further geographical data. May interest some elementary classes as supplementary material.

**U.S.A.** (Filmette, No. 117, si, 66 frames). Photographs showing typical landscape views and scenes of buildings, streets, and people in various cities. Identifying captions are provided in French, German, and English. Mainly scenic in nature, but a good pictorial overview that may be of interest as introductory material for elementary geography classes.

**United States Geography Series** (Stillfilm, 30 films, si, about 30 frames each). The filmstrips in this series present general views and information about the title subjects by alternating photographs and text frames. In general, the strips tend to be mostly "scenic" in nature, although some information on natural resources and industries is provided. The series is suitable for use in elementary geography or social studies either as introductory material or as supplementary and illustrative material. Individual titles with brief descriptions follow.

**Boston** (No. G-171).

**Chicago** (Parts I and II, Nos. G-134 and G-144).

**Denver** (No. G-125).

**Los Angeles** (No. G-18).

**New Orleans** (No. G-137).

**New York** (Parts I and II, Nos. G-135 and G-139).

**Philadelphia** (No. G-141).

**Salt Lake City** (No. G-172).

**San Francisco** (No. G-115).

**St. Louis** (No. G-130).

**Washington, D. C.** (No. G-20).

The above 13 filmstrips, dealing with cities, open with location maps, show photographs of buildings, monuments, parks, streets, industrial areas, etc. Text frames supply identification and some data on industries. "New York" (Part I) deals mainly with the harbor and transportation system; "New York" (Part II) shows Ellis Island and some aspects of procedures there for immigrants. "Chicago" (Part I) is concerned with buildings and parks; "Chicago" (Part II) provides information on the stockyards.

**Mount Rainier National Park** (No. G-108).

**Yellowstone National Park** (No. G-113).

**Yosemite National Park** (Parts I and II Nos. G-22 and G-23).

**Zion, Cedar Breaks, Bryce and Grand Canyon** (No. G-114).

The above filmstrips dealing with national parks provide location maps and various scenes of the parks stressing their natural beauty and recreational facilities.

**Columbia River Valley** (No. G-126).

**The Gulf Coast** (No. G-128).

**New Mexico** (No. G-209).

**North Carolina** (No. G-208).

**San Joaquin Valley** (No. G-120).

**Upper Hudson River** (New York) (No. G-136).

**Up the Mississippi** (No. G-129).

The above seven filmstrips dealing with states or specific regions present general information on major crops and industries, important cities, natural resources, and some data on climate and topography. The major stress is on the economic life. Strips concerned with rivers indicate their length, navigability, drainage area, and influence on cities and industry. "The Upper Hudson River" ends with a sequence showing historic landmarks in this region.

**Catalina Island** (No. G-124). Mainly views of tourist activities and attractions of the island; little geographical data except for some indication of industries.

**Dakota's Bad Lands** (No. G-140). Definition of "bad lands"; views of features of this area with text explanations. Suitable also for physical geography and elementary geology or general science classes.



**Lake Mead** (No. G-181). Opens with brief sequence on construction of Hoover Dam; major portion consists of scenic views of Lake Mead and the Colorado River.

**Niagara Falls** (No. G-145). Various scenic views of the falls; diagrams showing recession of crest since 1764; some information on hydroelectric power supplied. Better than most strips on this subject since economic value of falls is indicated and some geological information supplied.

**Puerto Rico and Minor U. S. Possessions** (No. H-75). Each of the following treated with information on method of acquisition, location map, principal products or industries, and some scenic views: Puerto Rico, Virgin Islands, Panama Canal Zone, Guam, Tutuila and other Samoan Islands. Ends with world map showing United States and its possessions. Text material good, but pictorial material mainly static scenes of each area. May also interest classes in United States history as supplementary material or for review purposes.

**Visit to Washington** (ACE, No. 21, si, 64 frames, lecture notes). Uncaptioned photographs presenting views of buildings, monuments, and streets of Washington, D. C. Treated in story form as visit to the capital by a group of children accompanied by their teacher. Interesting subject matter for supplementary material in elementary grades. Lecture notes provide data on buildings and their use, some history, etc.

**Wonders of the Carlsbad Caverns** (Eye Gate, si, 72 frames). Photographs of interior and famous "rooms" of these caverns. Text information on discovery, surrounding region, formation of stalagmites and stalactites. Suitable for use as supplementary material in elementary geography. Photographs in general are very good. Clothing of women shown in two frames is outdated.

See also the following series and individual titles for supplementary, illustrative, and related materials:

- Climates of the West Coast
- United States Geography Series
- Farming in Idaho
- Indian Art
- Indian Pottery Making
- Forests of the United States
- Forestry in Geography

## ALASKA, CANADA, AND ARCTIC REGIONS

**Alaska** (Stillfilm, 3 films, si, about 30 frames each). A general overview or summary of Alaska through alternating pictorial and text frames suitable for

use in elementary geography or social studies for review or as introduction to region. Individual titles with brief descriptions follow.

**Regional Geography** (No. G-15). Regions of Alaska; climate, topography, and industries of each. Includes maps of regions.

**Peoples and Occupations** (No. G-16). The four native groups and their mode of life; major industries of Alaska including fox raising, fur trapping, fishing, mining, transportation, and agriculture.

**Cities and Monuments** (No. G-17). Views of major cities with brief information concerning industries of each. Material on "monuments" includes boundary-line marker monument at highest point; miner's cabins; totem poles.

**The Alaska Cruise** (Eye Gate, si, 78 frames). Mainly scenic in nature showing views along the sea route to Alaska and in various parts of Alaska. Little geographic material. May interest some elementary classes as supplementary material. Clothing of travelers shown is outmoded.

**Beautiful Banff** (Eye Gate, si, 45 frames). Random scenic views of Banff and its surroundings with little geographic information. Elementary supplementary material.

**Canada** (Stillfilm, 6 films, si, about 30 frames each). The first three filmstrips in this series present a general overview of Canada through alternating pictorial and text frames and are suitable for use in elementary geography or social studies for review or as introduction to this region. The other three filmstrips provide additional information on specific areas and cities and may be of interest as supplementary material. Photographs are good and subject matter is well organized for classroom use. Individual titles with brief descriptions follow.

**Canada—Regional Geography** (No. 116). The three main geographical regions with information on climate, topography, major rivers, and provinces of each.

**Canada—People and Occupations** (No. G-117). Major industries including agriculture and its various types; fishing; fox farming and trapping; lumbering; mining; work of tourist guides.

**Canada—Cities and Monuments** (No. G-118). Views of the major cities with some indication of main industries of each; also views of farm homes, and trappers' and Indian cabins.

**Ontario and Quebec** (No. G-200). Maps of these two provinces, location of major cities, industries of each city and views of parks, streets, governmental buildings, etc.

**Nova Scotia** (No. G-201). A general survey of the Maritime Provinces showing harbors, major cities and their industries, importance of shipping, agriculture, lumbering, mining, and the tourist industry.



**Victoria and Vancouver: British Columbia** (No. G-120). Preview and general survey of this province with data on coast line; views and industries of Victoria and Vancouver; major industries of province; Indian tribes of the region.

**Down the Yukon** (Eye Gate, si, 60 frames). Mainly scenic in nature presenting various views seen during a trip down the Yukon. May be of interest as supplementary material in elementary geography.

**Exquisite Lake Louise** (Eye Gate, si, 42 frames). Views of Lake Louise and surrounding area including Mount Victoria, Lake Agnes, Mirror Lake, Lake O'Hara, Victoria Glacier, and Moraine Lake. Mainly scenic in nature with little geographical information. May be of interest as supplementary material in elementary geography.

**Far Horizons** (Eye Gate, si, 65 frames). Indicates cities as "imprisoning people with narrow horizons" and presents views of the Canadian Rockies as offering "far horizons." Entirely scenic in nature.

**Georgian Bay to Winnipeg** (Eye Gate, si, 44 frames). Random scenes during a boat trip from Georgian Bay to Winnipeg including Ojibway Inn, fishing and canoeing, portages, and some street scenes in Winnipeg. Entirely scenic in nature.

**Iceland** (SVE, si, 47 frames, manual). Uncaptioned photographs showing typical landscapes, coastal villages, town streets and buildings, people and their dress, farms, etc. Not usable without information of type supplied in manual which identifies pictorial material. Organization not clear.

**Labrador** (SVE, si, 49 frames, manual). Uncaptioned photographs showing coastal villages, typical landscapes, fishing activities, seal hunting, and some aspects of Eskimo life. Not usable without information of type supplied by manual, which identifies pictorial material. Rather random shots not clearly organized.

**The Land of Evangeline** (Eye Gate, si, 70 frames). Various views of Acadia, showing Port Royal, the village and people of Grande Pré, surrounding countryside, the French school, and Indians of this region. Ends with sequence quoting "Evangeline," illustrated by photographs of a girl in costume of Evangeline's era. Of little geographic value except as supplementary material, but some interesting views of the area. May also interest literature or reading classes that are studying "Evangeline."

**Life of the Eskimo** (Eye Gate, 2 filmstrips, si, about 100 frames each). General information about the life, appearance, clothing, homes, tools, implements, etc., of Eskimos. Suitable for use in elementary grades social studies. Photographic material in general is good; text material tends to be lengthy.

**Montreal, Old and New** (Eye Gate, si, 56 frames). Random scenes of old Montreal, showing streets, markets, buildings, etc., of the French section, followed by views of modern downtown Montreal and along the Saint Lawrence above the city. Mainly scenic in nature.

**On the Great Glacier** (Eye Gate, si, 59 frames). Views of Illecillewaet Glacier and surrounding mountains, including several showing guides and tourists making the descent to the glacier. Merely scenic in nature, providing little information about the glacier. Clothing of people shown is outmoded.

**Over the White Pass** (Eye Gate, si, 79 frames). Scenes along the way from Skagway to the White Pass, Mills Canyon, Lake Bennet, Jack London Falls, and White Horse Rapids. Entirely scenic in nature. Clothing and equipment shown is outmoded.

**A Summer Day in Skagway** (Eye Gate, si, 75 frames). Random scenes of Skagway and surrounding country. Entirely scenic in nature. Clothing and some of the equipment shown outdated.

**Vancouver and Victoria** (Eye Gate, si, 70 frames). Random views of these two cities, showing streets, buildings, parks, near-by forests and streams. Ends with sequence of Scottish games, parade, and dances.

See also Canadian Fishing for related or supplementary material.

## CENTRAL AMERICA

### AND THE WEST INDIES

**Central America** (Stillfilm, 9 films, si, about 30 frames each). General information concerning the countries indicated by the individual titles, suitable for use in elementary grades as introductory or review material. Pictorial frames and text frames alternate. Information includes maps, data on size and population, major towns or cities, occupations and products, photographs of the peoples, and similar material. The strip dealing with Honduras presents additional information on the educational progress in that country. Where a country is the subject of two separate strips (as Mexico and Guadalupe Island), the first provides information about physical geography and cities and the second about peoples and occupations. Individual titles follow.

**Mexico** (Part I, No. G-24).

**Mexico** (Part II, No. G-220).

**Guadalupe Island** (Part I, No. G-106).

**Guadalupe Island** (Part II, No. G-107).

**Panama** (No. G-19).

**Honduras** (No. G-215).



**Salvador** (No. G-216).

**Guatemala** (No. G-217).

**Nicaragua** (No. G-218).

**Central America and the West Indies** (Filmette, No. 120, si, 77 frames). Characteristic landscape views including scenes of people and cities, identified by brief captions in French, German, and English. Mainly scenic in nature, but may interest some geography classes as supplementary material or as review or introduction.

**Haiti—People and Occupations** (Stillfilm, No. G-219, si, 38 frames). Opens with map and data on size and population. Major part of strip presents views of streets and buildings in Port-au-Prince, transportation methods, markets, farms, fishing, and people. Mainly scenic with random views, but some factual material on Haiti. May interest elementary grades as supplementary material or as preview of this island.

**Mexico** (Filmette, No. 119, si, 72 frames). Characteristic landscape views including scenes of people and cities, identified by brief captions in French, German, and English. Mainly scenic in nature, but may interest some geography classes as supplementary material or for review or introduction.

**West Indies** (Stillfilm, No. G-155, si, 30 frames). Opens with map and data on population and origin of African strains. Major part of strip presents random views of markets, schools, products and industries, plantations, and towns. Includes views of Jamaica, Puerto Rico, Cuba, Saint Thomas. Mainly scenic in nature but may interest elementary grades as overview of these islands. Main stress is on industries and products.

## **SOUTH AMERICA**

**South America** (Foley and Edmunds, Kit No. V-062, 5 films, teacher's guide). This kit in its entirety contains seven charts and maps, a diorama, a picture set, and symbols for the maps in addition to the filmstrips. Photographs and maps, with some captions and some text frames. Material and vocabulary is of upper elementary level. Individual titles follow with brief descriptions.

**Peru and Ecuador** (41 frames, si). Peru shown as "land of the Incas," with much pictorial material on the Indians and their mode of life; some data on products of Peru and a few scenes of Lima, Callao, and Arequipa. Material concerning Ecuador includes data on products, Indian life and handicrafts, a few scenes of Quito. Treatment of cities is inadequate.

**Brazil** (59 frames, si). Includes material on products and industries, natural resources, exports, views of Rio de Janeiro, São Paulo, Santos, Belém. Stress on products and industries with lengthy sequences on coffee. Rather long, presenting a great deal of material for one class meeting.

**Bolivia and Chile** (58 frames, si). Major stress on the products and industries of these two countries, with some views of Lake Titicaca, La Paz, Valparaiso, Santiago, Indians, and recreational facilities.

**Argentina, Paraguay and Uruguay** (54 frames, si). Material concerning Argentina indicates its resemblance to the United States in topography and products; data on industries, natural resources, distribution of population by regions, ends with views of Buenos Aires. Sequences on Paraguay and Uruguay are very brief, giving some indication of industries and products and views of Montevideo and Asunción, little information on climate and peoples.

**Colombia, Venezuela and the Guianas** (55 frames, si). Products, major cities, life in villages, natural resources of each country shown. Colombia described as a "four-story" land, with products of each elevation indicated. Some information about the life of the people and relation to the United States.

**South America** (Filmette, 2 films, si). Characteristic landscape views with some scenes of cities and peoples. Brief captions in French, German, and English identify each scene. May interest some geography classes as supplementary or review material. Titles follow.

**South America** (Venezuela, Colombia, Ecuador, Brazil) (No. 122, 82 frames).

**South America** (Peru, Chile, Bolivia, Argentine Republic) (No. 122, 93 frames).

**South America** (Stillfilm, 8 films, si, about 30 frames each). A general overview of the country or countries named in the titles. Natural resources, products, and industries are stressed. Views of the major cities are included. May interest elementary geography classes as introductory or review material. Individual titles follow.

**Argentina** (Part I, No. G-25).

**Argentina** (Part II, No. G-26).

**Bolivia and Ecuador** (No. G-28).

**Brazil** (No. G-29).

**Chile** (No. G-30).

**Colombia, Venezuela, British Guiana** (No. G-31).

**Peru** (No. G-32).

**Paraguay and Uruguay** (No. G-27).

**South America** (SVE, 8 films, si, about 35 frames each, manual). A series of uncaptioned photographs of the country indicated by individual titles, including cities, farms or ranches and their products, other industries, activities of Indians, and scenes of typical landscapes. The material cannot be used without information



of the type supplied in the manuals, since the photographs are not identified in the strip itself. May interest elementary geography or social studies classes as supplementary material. Individual titles follow.

**Argentina**

**Bolivia**

**Brazil, Southern Highlands and Coastal Plain**

**Chile, the Republic of**

**Ecuador**

**Peru, the Andean Highlands**

**Peru, Western Coastal Lowlands**

**Venezuela**

See also the Coffee Industry and the Story of Cocoa and Chocolate for illustrative, supplementary, and related material.

## **EUROPE**

**Characteristic Landscape Views** (Filmette, 45 films, si). A series of photographs showing characteristic landscape views and major physical features of the countries or regions indicated by the individual titles. Those strips concerned with European cities show streets, major buildings, parks, markets, transportation, etc. Each scene is identified by brief captions in German, French, and English.

Photographic material in general is excellent. No attempt at interpretation is made, but the material may be useful in some geography classes to show the appearance and physical features of countries. If used as supplementary material, members of the classes could provide additional information for the pictorial material shown. Individual titles with film number and number of frames follow.

**The Baltic Sea** (No. 73, 66 frames).

**Lübeck** (No. 74, 66 frames).

**Danzig** (No. 75, 57 frames).

**The North Sea** (No. 76, 78 frames).

**Hamburg** (No. 77, 84 frames).

**Bremen** (No. 78, 43 frames).

**Berlin** (No. 79, 109 frames).

**Potsdam and Sans Souci** (No. 80, 100 frames).

**The Harz** (No. 81, 65 frames).

**Dresden** (No. 82, 66 frames).

**The Giant Mountains** (No. 83, 60 frames).

**Nuremberg** (No. 84, 74 frames).

- Munich (No. 85, 59 frames).
- Rothenburg (No. 86, 58 frames).
- Heidelberg (No. 87, 52 frames).
- The German Alps (No. 88, 94 frames).
- Bavarian Peasant Life, Costumes and Art (No. 89, 50 frames).
- Switzerland (No. 90, 160 frames).
- The Rhine (No. 91, 104 frames).
- Zurich (No. 92, 100 frames).
- Lake Lucerne (No. 93, 110 frames).
- Gotthard, Furka, Grimsel (No. 94, 80 frames).
- Prague (No. 95, 85 frames).
- Vienna (No. 96, 77 frames).
- The Austrian Alps and Dolomites (No. 97, 97 frames).
- Italy (No. 98, 104 frames).
- Paris (No. 99, 121 frames).
- Versailles (No. 100, 50 frames).
- Fontainebleau (No. 101, 50 frames).
- Brussels (No. 102, 51 frames).
- Ostend, Bruges, Antwerp, Ghent (No. 103, 56 frames).
- Amsterdam (No. 104, 44 frames).
- Spain (No. 105, 84 frames).
- English Landscapes (The North) (No. 106, 59 frames).
- English Landscapes (The South) (No. 107, 57 frames).
- London (Part I, film No. 108, 70 frames).
- London (Part II, film No. 109, 63 frames).
- Oxford and Cambridge (No. 110, 45 frames).
- Scotland (No. 111, 61 frames).
- Copenhagen (No. 112, 50 frames).
- Bornholm (No. 113, 75 frames).
- Norway (No. 114, 62 frames).
- Sweden (No. 115, 70 frames).
- Finland (No. 116, 51 frames).

Europe (Eye Gate, 12 films, si). The filmstrips in this series present random scenic material with identifying text frames. Those concerned with cities show typical street scenes, famous buildings, parks, monuments, markets, etc. Clothing and automobiles shown in the photographs are outdated. Individual titles with brief descriptions where needed follow.

Along the Riviera (70 frames). Location of region; random scenes of country, villages, and resorts.



**Bordeaux to Lourdes** (88 frames). Location and route of journey shown on map; views along way and in both cities; includes a long sequence on the Pau fox hunt. Shrines in Lourdes shown.

**Marseilles** (89 frames). In addition to usual scenes, includes some data on climate and the importance of harbor.

**Nice and Cannes** (98 frames). In addition to usual scenes includes sequence on parade of Battle of Flowers in Cannes.

**Pyrenean Perspectives** (44 frames). Scenic views in the French Pyrenees.

**Immortal Rome** (66 frames). Various scenes of modern Rome with some historical data on buildings and monuments.

**In Barcelona** (70 frames). In addition to usual views, includes a good sequence on Barcelona harbor and its history, and a brief sequence on a church festival.

**In New Madrid** (60 frames). In addition to usual views includes a sequence showing the changing of the guard at the palace of the Kings of Spain.

**Palma de Majorca** (70 frames). Location of Palma and the Balearic Islands. Scenes mainly of peasants, their costumes, and activities.

**Spanish Children** (70 frames). Various photographs of Spanish children of different types. Very little information about their activities or mode of life.

**Spanish Holidays** (95 frames). Views of activities during annual April Fair at Seville and in Madrid on birthday of Alfonso XIII.

**Toledo and Segovia** (59 frames). Views of streets, buildings, and activities in these two cities.

**Europe** (Stillfilm, 57 films, si, about 30 frames each). General views and information about individual title subjects through alternating photographs and text frames. In general, the strips tend to be mainly "scenic" in nature, although some information is provided on industries and occupations. Suitable for use in elementary geography or social studies either as introductory material or as supplementary and illustrative material. Individual titles follow with brief descriptions where necessary.

**Denmark, People and Occupations** (No. G-159). Map, location of country and of Copenhagen, data on climate. Major stress on industries and occupations. Some information on schools, museums, and government.

**England** (4 filmstrips).

**Rural England** (No. G-34).

**Regional Geography** (No. G-35).

**London** (No. G-36).

**People and Occupations** (No. G-37).

**France, Northern** (3 filmstrips). First film in this group provides views of several harbors and cities, canals, villages, and little "regional" geography. The strip dealing with Paris includes mainly views of parks, streets, buildings, and monuments.

**Regional Geography** (No. G-132).

**People and Occupations** (No. G-160).

**Paris** (No. G-42).

**France, Southern** (3 filmstrips). The first film in this group presents general views of various areas in southern France; the second stresses industries and occupations, mainly farming; the third shows random views in such cities as Marseilles, Lyons, Nice, Mentone, Grasse, etc., and some monuments or statues in each.

**Regional Geography** (No. G-39).

**People and Occupations** (No. G-161).

**Cities, Views and Monuments** (No. G-41).

**Finland** (2 filmstrips). The first film stresses industries and occupations but includes views of several cities. The second shows buildings, streets, harbor, residential section, and some industries of Helsinki.

**People and Occupations** (No. G-175).

**Helsinki** (No. G-191).

**Germany** (5 filmstrips). The first film in this group shows extent, topography, and views of major regions. The second and third stress industries and occupations with little information about the people. The last two provide random views of streets, residences, buildings, parks, etc. Film No. G-48 includes Hamburg, Dresden, Berlin, Weimar, Munich, Cologne, Eisenach, and the Rhine castles.

**Regional Geography** (No. G-46).

**People and Occupations** (Part I, No. G-153).

**People and Occupations** (Part II, No. G-189).

**Cities, Views and Monuments** (No. G-48).

**Berlin, City and Monuments** (No. G-168).

**Greece** (2 filmstrips). The first film provides a general overview of the country including harbors, cities, climate, major industries, village life, etc. The second shows various ancient statues and buildings as they appear today, including the Acropolis, Parthenon, Theseum, several temples, etc. This latter strip may also interest history and art classes.

**Modern Greece** (No. G-44).

**Monuments of Ancient Greece** (No. G-45).



**Holland** (2 filmstrips). First strip shows mainly random views of village people and their occupations and work of fishing fleet; second includes streets, buildings, and monuments of Amsterdam, The Hague, Delfhaven, and Middelburg. Suitable for lower elementary grades in vocabulary and subject matter.

**People and Occupations** (No. G-50).

**Cities, Views and Monuments** (No. G-51).

**Hungary** (2 filmstrips). First strip includes data on topography and shows industries as related to country's topographical regions; some views of village life. Second strip shows various views of Budapest—streets, statues, parks, buildings.

**People and Occupations** (No. G-169).

**Budapest** (No. G-170).

**Ireland** (2 filmstrips). Buildings, streets, monuments in Dublin, Cork, and Cóbh; Blarney Castle with views of countryside is shown in first strip. Second strip stresses occupations, mainly farming.

**Cities, Views and Monuments** (No. G-173).

**People and Occupations** (No. G-174).

**Italy, Northern** (5 filmstrips). These five strips consist mainly of random scenic views with unusual occupations and peasant life as major topic in first two. The three dealing with cities show streets, famous buildings, and monuments.

**Regional Geography** (No. G-52).

**People and Occupations** (No. G-53).

**Cities, Views and Monuments** (No. G-54).

**Venice** (No. G-61).

**Florence** (No. G-62).

**Italy, Southern** (3 filmstrips). First strip presents general views, rather than regional data, with long sequence on Capri. Second strip stresses unique occupations and village life. Third strip shows streets, buildings, and monuments of cities and towns such as Naples, Santa Lucia, Amalfi, Ravello.

**Regional Geography** (No. G-55).

**People and Occupations** (No. G-56).

**Cities, Views and Monuments** (No. G-57).

**Norway** (2 filmstrips). First strip provides a general overview of the country, with much on climate, topography, and problems these bring to the people. Second strip shows main occupations of farmers, fishermen, and Lapps.

**Regional Geography** (No. G-66).

**People and Occupations** (No. G-67).

**Poland** (2 filmstrips). First strip shows random views of streets, buildings, and monuments in Warsaw, Danzig, Cracow, Wilno, and some villages. Second stresses occupations and industries; shows typical farm homes; indicates work in mines and mills.

**Cities, Views, Monuments** (No. G-176).

**People and Occupations** (No. G-177).

**Portugal** (2 filmstrips). First strip includes views of Lisbon, Oporto, and Cintra. Second stresses occupations, mainly those of the peasants.

**Cities, Views, Monuments** (No. G-178).

**People and Occupations** (No. G-179).

**Russia** (3 filmstrips). First strip stresses occupations, mainly those of remote regions and groups of people. Second includes views of collective farms, factories, education, playgrounds, and schools, etc. Strip on Moscow shows various views of the city with some information on its status as chief city of the U.S.S.R.

**People and Occupations** (No. G-154).

**Soviet Russia** (No. G-68).

**Moscow** (No. G-69).

**Scotland** (2 filmstrips). First strip shows topography and some industries and cities. Second stresses occupations, but provides additional information on life of peasants, villagers, and townspeople.

**Regional Geography** (No. G-70).

**People and Occupations** (No. G-71).

**Spain, Southern** (3 filmstrips). First strip provides some regional geography but mainly random scenic views. Second strip is mainly composed of unusual occupations such as bullfights, peasant women's work, primitive transportation, etc. Last strip shows buildings, streets, etc., in Granada, Ronda, Seville, Córdoba, and Toledo.

**Regional Geography** (No. G-72).

**People and Occupations** (No. G-73).

**Cities, Views and Monuments** (No. G-74).

**Sweden** (3 filmstrips). First two resemble strips of this nature in other groups. Last strip shows views of Stockholm, Göteborg, Malmö, Gotland.

**Regional Geography** (No. G-121).

**People and Occupations** (No. G-122).

**Cities, Views and Monuments** (No. G-123).

**Switzerland** (2 filmstrips). First strip stresses mainly major peaks of the Alps, with some scenes of various lakes. Second strip stresses industries, mainly those of peasants, and includes some scenes of Geneva and Saint-Moritz.



**Regional Geography (No. G-76).****People and Occupations (No. G-138).**

**Living in Other Lands** (SVE, 5 films, si, about 42 frames each). Photographs and text alternate in showing various scenes in the life of the child named in each title. Includes the following: rural and city homes; national costumes; farms and farm buildings; churches; major industries; schools; transportation; landscapes and views of country's major cities. Each strip includes a brief reading list. Suitable for reading or social studies in elementary grades. Individual titles follow:

Hilda of Denmark

Ingrid of Norway

Greta of Sweden

Helvi of Finland

Einar of Iceland

**The Netherlands and Its Territories** (Foley and Edmonds, 2 kits, 5 filmstrips, si, teacher's guides). These two kits contain charts, still pictures, and maps in addition to filmstrips and are available either as complete kits or as filmstrip sets without the other materials. The materials are suitable for use in upper elementary or junior high school geography or social studies as introductory or supplementary aids. The kits are described separately below.

**Holland and the West Indies (No. V-085, 3 filmstrips, guide).**

**Holland, the Land and Its People** (45 frames). Typical landscape views including many dikes, canals, and windmills, with some explanation of drainage and resulting polders. Principal agricultural products. Views of streets and buildings in major cities and in villages.

**Holland, a Maritime Nation** (35 frames). A study of shipping as Holland's major industry: the harbors, reasons for Holland's importance as maritime nation; naval traditions; shipbuilding; fishing industry; maritime activities as promoting Holland's manufacturing; ends with sequence on inspiration of sea to great painters.

**The Netherlands West Indies** (42 frames). Industries, natural resources, towns, native and modern homes, and typical landscapes of Curaçao and Surinam.

**Netherlands East Indies (No. V-075, 2 filmstrips, guide).**

**The Netherlands East Indies** (44 frames). Views of streets, markets, dances, transportation in Java, Bali, Sumatra, Celebes. Major products and natural resources. Typical landscape views. Scenes in major cities.

**Java and Sumatra** (55 frames). Typical scenes of towns, cities, landscape, and native life; major handicrafts and industries, natural resources, and products.

**Russia—The Soviet Union** (Informative, si, 52 frames). A general overview of many aspects of the Soviet Union, with some brief historical data and changes made since time of the Czars. Includes views and some information on the following: the many nationalities; women workers; collective farms; the Kirghiz farmers; Baltic Republics; the Ukraine; the Kremlin; industrial workers and their homes; Leningrad; use of both dog sleds and planes in the Arctic; electric express train through Caucasus; government ownership of land; village life; animals; oil wells; steel industry; native handicrafts; markets; schools and camps. Photographs with lengthy captions and a number of long text frames. General in nature, touching lightly many regions and many phases of the geography of this country. Presents an incomplete picture that would require considerable amplification by the teacher.

**U.S.S.R.—The Land and the People** (Brandon, si, 85 frames, lecture notes). Opening sequence shows varied types of people in the U.S.S.R. Other sequences deal with the following: geographical data—size, climate, vegetation, topography. Development of natural resources—including dams, factories, and collective farms. Soviet production—views of various industries and transportation methods. Farms—use of machinery, variety of products. Development of human resources—schools, health services, sports, etc. U.S.S.R. and U.S.A.—part of the U.S.S.R. in the war, shipments received from U.S.A., Yalta Conference.

Depends heavily on information of nature provided in lecture notes as text in film does not supply complete information. A great deal of material for one class session and might be better if shown in sections. Does not provide complete data on the U.S.S.R., particularly about the people, but may provide a good basis for discussion in junior or senior high school.

See also *Greece Throughout the Ages* and *People of France* for supplementary and related material.

## ASIA

**Asia** (Filmette, si, 105 frames). Photographs of various peoples of Asia and their villages, including a few scenes of activities and methods of transportation. Main emphasis on types of people. Includes Kalmucks, various Arab tribes, Jews of Palestine, Tibetans, various groups in India, China, Japan, Java, Anam, Batavia, Burma. Each photograph is identified by brief captions in French, German, and English. Suitable for use in upper elementary or junior high school social studies to show varied types of peoples living in Asiatic countries. May also be of interest as supplementary material in ethnology classes on college level.

**Burma, People and Occupations** (Stillfilm, No. G-207, si, 35 frames). An overview of Rangoon and Burma. Includes data on population and types of people



and on exports and products. Views of Rangoon include streets, buildings, temples, monasteries, markets. Views of native homes along rivers and of interior. Suitable for use as introductory or review material in upper elementary or junior high school social studies. Some scenic frames, but considerable factual information.

**Characteristic Landscape Views** (Filmette, 7 films, si). The filmstrips in this group present series of photographs showing typical landscape views and major physical features of the countries indicated in the individual titles. Some views of cities are included. Each scene is identified by brief captions in French, German, and English. Suitable for use as illustrative material in classes interested in these countries. Individual titles are listed below.

**Mesopotamia** (No. 127, 69 frames).

**Voyage to Eastern Asia** (No. 128, 102 frames).

**India** (with Ceylon) (No. 129, 99 frames).

**Japan** (No. 130, 65 frames).

**China** (No. 131, 75 frames).

**Java** (No. 132, 75 frames).

**Malacca and Sumatra** (No. 134, 49 frames).

## China

**China** (Stillfilm, 6 films, si, about 30 frames each). Photographs and text frames alternate in these filmstrips presenting scenic material on the subjects indicated by the individual titles. Suitable for use as supplementary material in elementary or junior high school geography and social studies. Individual titles with brief descriptions follow.

**Regional Geography** (No. G-89). The Great Wall; the northern areas and their products; Manchuria; canals; life on rivers; minerals of Szechuan province; harbors. Mainly random scenic views with some factual information in text.

**People and Occupations** (No. G-90). Scenes of the people as tillers of soil, methods used, and products; fish markets; peddlers and coolies; clothing; mission schools; funeral procession.

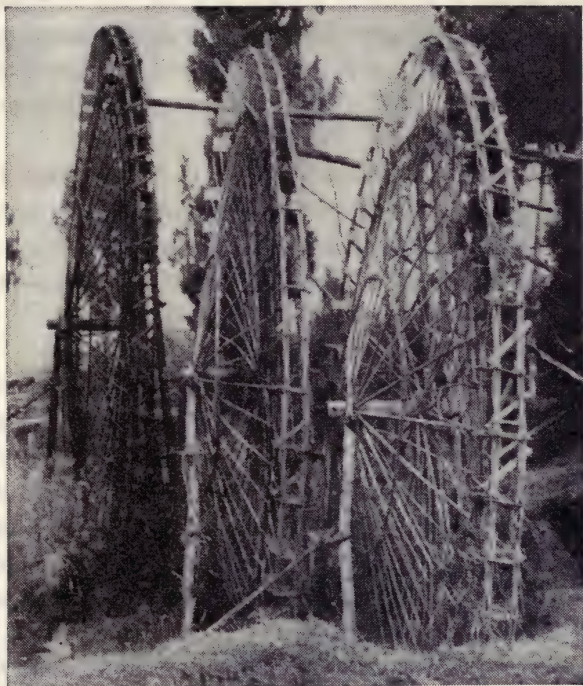
**Land Transportation** (No. G-92). Views of various methods of land transportation used in China, stressing the unique or primitive, including sedan chairs, camels, rickshas, bullock carts, coolies, etc.

**Water Transportation** (No. G-93). Views of various methods of water transportation used in China, stressing the unique or primitive, including junks, sampans, houseboats, cormorant fishing, decorated boats, etc.

**Peking** (No. G-94). Views of streets in Outer City, gates, temples, Prospect Hill, the Imperial City, Summer Palace, walls of Forbidden City.

**Macao** (No. G-180). Opens with factual sequence on Portuguese concession, population, types of people, importance as western terminus of Pacific airplanes. Followed by views of streets, buildings, gardens, shops, children, etc.

**City That Never Sleeps** (Canton) (Eye Gate, si, 61 frames). Scenic in nature, showing views of harbor and shipping, life on boats, views of streets, shops, mar-



From filmstrip "Let's Look at China." (*United Service to China, Inc.*)

kets; scenes of island on which foreign people live and work. Supplementary material for elementary or junior high school classes.

**Island of the Mist** (Hong Kong) (Eye Gate, si, 61 frames). Scenic in nature, showing water-front scenes, streets, English settlement, botanical gardens, views of city from the Peak. Mentions Hong Kong as "one of the naughtiest cities in the world"; several comments about the smells in the city streets.

**Let's Look at China** (United China Relief, si or sd, 161 frames, lecture notes). First part provides considerable data on history and geography, including building of Great Wall, the emperors and the Forbidden City, Dr. Sun Yat Sen, activities of peoples, handicrafts and industries, agriculture, methods and produce, importance of rivers and canals. Second part shows China's war with Japan: destruction; work of men, women, and children; concealed industries and



schools; airfields, etc. Ends with need for assistance. First part suitable for use in upper elementary and high school social studies. Second part somewhat dated, but may interest classes in modern history or adult groups.

### **East Indies**

**Batavia—People and Occupations** (Stillfilm, No. G-211, si, 38 frames). Map of East Indies, location of Java and Batavia. Data on type of population. Views of native section and of new city; harbor, canals, shops, homes, native musical instruments, transportation methods, plantations and their products. May be of interest as overview or introductory unit for elementary or junior high school social studies or geography.

**Dutch East Indies** (Stillfilm, 2 films, si, about 30 frames each). The two filmstrips together present a usable overview of Java for introductory purposes in elementary or junior high school classes. Some scenic material.

**Java—Regional Geography** (Part I, No. G-102). Data on population; coast; natives and their activities; topography of Java; types of crops in various areas; rainy season; Surabaya.

**Java—People and Occupations** (Part II, No. G-103). Various types of natives, homes of natives and of Dutch, the Chinese quarter; occupations, handicrafts, and industries; products.

**Rice Industry in Java** (Stillfilm, No. A-3, si, 24 frames). General information concerning rice raising in Java showing soil requirements, preparation of soil, use of water and flooding of fields, planting, terracing of fields, transplanting, harvesting, winnowing, and threshing. Suitable for use in elementary geography classes to show methods of rice raising in Orient.

**Sumatra—People and Occupations** (Stillfilm, No. G-184, si, 32 frames). Map showing location; data on size and type of population with photographs of natives; home life and work of Bataks; views of other natives and their activities. Opening material presents good information of population types. Remainder of strip mainly of native life. Suitable for use as supplementary material.

### **India**

**India** (Stillfilm, 4 films, si, about 30 frames each). Text and photographs alternate presenting general information on the subjects indicated by the individual titles. Some scenic material. Suitable for use in upper elementary or junior high school geography or social studies as introductory material. Individual titles with brief descriptions follow.

**People and Occupations** (No. G-98). Place in British Commonwealth; castes; the lowlands and mountain areas contrasted; agriculture—methods and

products; other products and industries; views of Calcutta and Bombay, Taj Mahal, village school. Useful as overview for unit on India.

**Calcutta** (No. G-205). Importance as rail center; jute industry; views of modern sections and native quarters and of schools. Second part shows scenes of surrounding country, farms, and the Himalayas.

**Ceylon** (No. G-182). Composition of population; natives; agricultural methods and products; work of natives; shops and streets.

**Pearl Fishing in Ceylon** (Unnumbered). Description of pearl oyster; the pearling fleet; divers and equipment; packing and marketing; examination and grading of pearls; the pearl driller. Supplementary material.

### **Iraq**

**Iraq, People and Occupations** (No. G-165). Mainly scenic in nature, showing the following: primitive water transportation methods; views in Bagdad, Mosul, Nineveh, Arab village, Kurd home. Suitable for use as supplementary material.

### **Japan**

**Cabarets of Old Japan** (Eye Gate, si, 36 frames). Views within a typical Japanese "cabaret": orchestra, dancers, costumes, garden, hairdress, tying of the obi, use of chopsticks.

**Japan** (Stillfilm, 3 films, si, about 30 frames each). Photographs and text frames alternate providing scenic material and some views of handicrafts and primitive industries. These three films may be used as supplementary material in elementary social studies. Little information on modern Japan included. Titles follow.

**People and Occupations** (Part I, No. G-95).

**People and Occupations** (Part II, No. G-96).

**Cities, Views, Monuments** (No. G-119).

### **Malaya**

**Malaya** (Hawley-Lord, si, 45 frames). Overview of Malaya, its place in world trade, industries, and peoples. Opens with maps, indications of political divisions and complexity; brief résumé of history of Malay States. Views of Singapore, Penang, and Kuala Lumpur. Life of villagers and of Indian and Chinese populations. Major industries. Modern hospitals, schools, and shops. Indicates progress in industrial development and Malayan contributions to the world. Considerable information about Malayan geography and peoples. Suitable for junior or senior high school social studies. Approaches the "global" geography concept and inter-relationship of nations.



**Singapore and Straits Settlements** (Stillfilm, No. G-204, si, 36 frames). Map of the three settlements; location of Singapore. Views of Singapore including port, buildings, populations, chief exports, natives. Agricultural methods and products of Straits Settlements; transportation; use of elephants; some native birds. Beginning provides some good material for elementary or junior high school social studies. Remainder is mainly scenic and of use as supplementary material.

### **Palestine**

**At the Wailing Wall** (Eye gate, si, 81 frames). Many scenes of groups at the Wailing Wall; various views of Jerusalem, Valley of Jehoshaphat, and of mosques. Some data on history of Jerusalem in text frames.

**Jerusalem** (Stillfilm, No. G-148, si, 32 frames). Opens with world map, location of Palestine. Major part of strip presents views of Jerusalem, including Damascus Road, Jaffa Road, Hotel Allenby, Jaffa Gate, street scenes, markets, Wailing Wall, Temple area, etc. Mainly scenic in nature. May be of interest as supplementary material in elementary grades.

**Jerusalem, the Holy City** (Eye Gate si, 83 frames). Map showing location of city. Various scenes, including buildings, streets, Tower of David, Mount of Olives, Garden of Gethsemane, place of Crucifixion, the rock of Golgotha, stations along Way of the Cross. Text material consists of Biblical quotations and some brief captions. Mainly scenes of places mentioned in the Bible. May be of most interest to Sunday Schools and other church groups.

**Palestine and Syria** (Stillfilm, No. G-147, si, 32 frames). Maps of world, of Syria, and of Palestine. Views of various cities including Bethlehem, Jerusalem, Nazareth, Tiberius, Megiddo; primitive agricultural methods; River Jordan. Section on Syria includes Tyre, bazaars, Damascus, weaving, Aleppo, and a few scenes of natives. Mainly scenic in nature. Suitable for use as supplementary material.

**Solomon's Temple** (Eye Gate, si, 74 frames). Location of temple. Present Mosque of Omar on temple site. Reproductions of Solomon's Temple, history of destruction; model of Roman temple raised on site; surroundings of temple; alterations by additions and destructions; interiors of ancient temple and of modern mosque. History of temple shown clearly through use of models. Supplementary material for upper elementary and junior high school. May interest Sunday schools.

### **Siam**

**Siam, People and Occupations** (Stillfilm, No. G-183, si, 30 frames). Mainly scenic in nature. Includes views of Bangkok—palaces, celebration, streets—of

products, river transportation, native homes, preparation of hemp, primitive agricultural methods. Supplementary material only.

See also *Caring for China's Children and Through China's Gateway* for supplementary or related material.

## AFRICA

**Africa** (Filmette, No. 137, si, 88 frames). Photographs of various types of peoples living in Africa, with some views of typical villages and activities. Includes natives of various sections of northern, central, eastern, and southern Africa, showing Tuareg, Bornu, pygmies, Nubians, fellah women, Ashanti, Hausa, Cameroons, Masai, Owambos, Kaffirs, Hottentots, Zulus, etc. Each photograph is identified by brief captions in French, German, and English. Suitable for upper elementary, junior, or senior high school classes to show types of peoples living in Africa. May also interest ethnology classes as supplementary or illustrative material.

**Africa** (Stillfilm, 16 films, si, about 30 frames each). Text frames and photographs alternate in presenting information and views of the countries or cities indicated by the individual titles. The filmstrips provide general overviews with major stress on natives and occupations, and contain much scenic material. Unless otherwise indicated, suitable as supplementary material in elementary or junior high school social studies or geography. Individual titles follow with descriptions where necessary.

**Egypt** (5 filmstrips). The two strips on modern Egypt present mainly scenic material on Cairo, Port Said, other towns, and landscape. Those dealing with peoples and occupations show various native groups and industries both primitive and modern.

**Modern** (Part I, No. G-85).

**Modern** (Part II, No. G-86).

**People and Occupations** (Part I, No. G-87).

**People and Occupations** (Part II, No. G-88).

**Nile Voyage** (No. G-81).

**Suez Canal and Port Said** (No. G-78). Views of canal entrance, breakwater, Port Said harbor and water front, native sections, ships in canal, Camel Corps canal guard, dredging, lakes along route, Port Tewfik.

**Abyssinia, People and Occupations** (No. G-151). Mainly occupations of the natives.

**Union of South Africa** (No. G-164). Position in British Commonwealth, the four provinces; life of natives; principal industries and products; Cape Town. Major part concerned with natives and their mode of life.



**Transvaal** (No. G-190). Location; composition of white population; Johannesburg; natives and their mode of life; major industries and products. Good factual overview of this region.

**Cameroon** (No. G-150). Location, size, government; natives and their mode of life.

**Congo, Peoples and Occupations** (No. G-162). Major part concerned with natives and their mode of life.

**Gold Coast Colony** (No. G-77). Location; map of cities and coast; views of several harbors; Accra; interior trading stations; natives and their mode of life.

**Morocco, Country and People** (No. G-163). Location; scenic views; natives and their mode of life.

**Arabia—Cities and People** (No. G-149). Map of Arabian Peninsula and other areas of Africa in which Arabs live; photographs of several Arabian types; views of several towns; villages; life in oases and desert.

**French Tunisia** (No. G-185). Map; size and population; varied nationalities; views of buildings, streets, shops, Jewish quarter, markets, children. Mainly random views.

**Tangier, Peoples and Occupations** (No. G-186). Map; location in international zone; views of harbor, shipping, old and modern streets and buildings, markets, natives.

**Biskra, the Beautiful Oasis** (Eye Gate, si, 80 frames). Map showing location; various scenes of caravans, the oasis, streets, colonial troops, Arabs, home of tribal chieftain, and surrounding desert. Mainly scenic in nature. May be of interest as supplementary material in elementary or junior high school classes.

**Calling on the Sphinx** (Eye Gate, si, 64 frames). Photographs with some historical and geographic data on Pyramids, Nile lowlands, Libyan Desert, camel transport; cross-sectional drawing of Great Pyramid, scenes of other pyramids, many views of Sphinx and comment on lack of information about it and theories concerning it. Mainly scenic in nature, but some historical data re ruins and pyramids. May be of interest as supplementary material in elementary and junior high school classes.

**The Union of South Africa** (Union of South Africa, si, 71 frames, manual, loan). First part presents a résumé of the history of the Union of South Africa, including Dutch settlements, reasons for British settlements, the Great Trek, independent republics, the Boer War, map of Union and data re government and its place in British Commonwealth. Second part presents geographic information through a "trip," showing the cities and towns, industries and products, natives, and landscape and topography. Ends with chart of imports and exports. Good

material for social studies or geography in junior or senior high school. Much information and probably should be shown in sections or several times.

See also *Wildlife of Africa* for supplementary or related material.

## AUSTRALIA AND NEW ZEALAND

**Australia** (Filmette, No. 135, si, 53 frames). Photographs of typical landscape views with some photographs of towns identified by brief captions in French, German, and English. Useful as illustrative material in geography classes on all levels, particularly to show topography.

**Australia** (Stillfilm, No. G-167, si, 35 frames). Photographs and text alternate to present an overview of this continent. Includes description of topography; sports, educational system and schools; views of Sydney, Melbourne, Adelaide, Canberra; sheep and cattle raising; development of agriculture and irrigation; natives and their mode of life. Suitable as introductory material in elementary or junior high school.

**Australia and New Zealand** (Foley and Edmunds, 4 films, si, guide). The entire kit contains, in addition to the four filmstrips, charts, picture sets, and maps. Good material for upper elementary or junior high school social studies, as it contains historical, geographical, and economic information. The strips are well organized for classroom use. Individual filmstrip titles follow with brief descriptions.

**Australia, a Continent Developed** (No. 1, 50 frames). Historical data: discovery, settlement of Sydney, strange plant and animal life found by settlers—many animals, plants, and fish shown. The aborigines; the six states, government, and status in British Commonwealth.

**The People of Australia** (No. 2, 56 frames). Comparison with Americans; people as mainly descendants of immigrants from British Isles; views of various buildings; money compared with American money; scenes in various cities, buildings, streets, shops, homes; towns and villages in various parts of the continent; cattle station; transportation problems and methods.

**The Australians at Work** (No. 3, 62 frames). Graphs of various activities and types of industry, imports, and exports. Scenes and data concerning major industries and occupations and products, indicating some of the problems and comparison of production with that of other countries, particularly agricultural products.

**New Zealand** (No. 4, 60 frames). Opens with brief history of New Zealand, its discovery, and settlement. Second sequence deals with life of the



Maori and the beauty of New Zealand landscape. Major products and industries indicated. Transportation problems. Views of cities and typical smaller towns. Aspects of everyday living, such as camps, government services, postmen, school children, vocational schools and college. Scenes of Maori life.

**New Zealand** (Stillfilm, si, 39 frames). Location; data on population. Views of volcanoes, of Auckland, Wellington, Christchurch, farms and farm products, mining and other industries, and of Maori life. A general overview of New Zealand suitable for use as introductory material for elementary or junior high school classes.

See also *Australian Animals* for supplementary or related material.

### PACIFIC ISLANDS

**Beautiful Hawaii** (Stillfilm, 2 films, si, about 30 frames each). Part I (No. G-100). Scenic views of Hawaiian landscape, craters, lava bed, seacoast, farms, and plantations. Part II (No. G-101). Various scenes of natives and their mode of life, with a few photographs of modern homes and schools. Mainly scenic in nature. May be of interest as supplementary material in elementary grades.

**The Island of Guam** (Stillfilm, si, 32 frames). Opens with map showing location, some data on discovery, history, and acquisition by United States and on importance as ship and plane base. Major part deals with natives and their mode of life; views of Agaña and Pitti. Mainly scenic in nature, but opening sequence provides some data of interest to elementary or junior high school social studies. Rest of film usable as supplementary material.

**Kilauea** (Eye Gate, si, 22 frames). Various views of Kilauea, the great volcano on the island of Hawaii including views as the slope is ascended and of the crater. Scenic in nature, but may be of interest as supplementary material.

**Philippine Islands** (Stillfilm, 2 films, si, 30 frames each). Part I, "Regional Geography" (No. G-131). Map, data on volcanic origin, extent, and number of islands. Rest of strip provides views of topography and typical landscapes in various regions; some views of natives and of river transportation. Ends with views of the harbor of Manila.

Part II, "People and Occupations" (No. G-105). Views of Negritos, Malaysians, Moros, and their mode of life. The section dealing with occupations stresses those of the natives, including handicrafts and agricultural products. Both strips are mainly scenic in nature, but may be of interest either as introductory or as supplementary material in elementary or junior high school social studies and geography.

**The Philippines and Hawaiian Islands** (Filmette, No. 133, si, 64 frames). Typical landscape views with some photographs of peoples and cities. Each view is identified by brief captions in French, German, and English.

Suitable for use as illustrative material in any geography class, particularly to show topography.

**Samoa and Pago-Pago** (Stillfilm, No. G-206, si, 27 frames). Opens with map of location; importance of strategic position of Samoa. Views of harbor and ship-



From filmstrip "Venice of the Orient—Manila, P. I." (*Eye Gate House*.)

ping, U.S. naval station, harbor of Pago-Pago, natives, and the Travelers Trees. Mainly scenic in nature, but opening sequence provides some material suitable for use in elementary or junior high school geography.

**South Sea Islands—Fiji** (Stillfilm, No. G-152, si, 31 frames). Opens with map and data on size, population, British possession, chief products. Rest of film includes views of Suva harbor, natives and their mode of life including handicrafts and occupations, and rubber plantations. Mainly scenic in nature. May interest elementary classes as supplementary material.

**Venice of the Orient** (Manila, P. I.) (*Eye Gate*, si, 59 frames). Opens with map of islands and location of Manila, followed by data on importance in trade and as distribution center. Rest of film provides various views of Manila including shipping in harbor, streets, transportation methods, buildings, canals, cocking mains. Emphasis on the unusual rather than on Manila itself, but some material of interest to elementary or junior high school geography and social studies classes.



**GENERAL**

**National Costumes and Types (Europe)** and **National Costumes and Types (Non-European)** (Filmette, 2 films, si). The film concerned with European types (No. 138, 65 frames) provides photographs of the people and the national costumes of the following countries: Ireland, England, Finland, Norway, Sweden, Germany, Netherlands, France, Spain, Italy, Moravia, Austria, Hungary, Yugoslavia, Serbia, Bulgaria, Rumania, and Greece. Each is identified by brief titles in German, French, and English. The other film (No. 139, 52 frames) provides the same type of material on peoples of various North American Indian tribes, Eskimos, various groups in Asia. Suitable for use as supplementary material in upper elementary or junior high school geography or social studies. Dramatics classes may find these strips of interest in the study of costume. May also interest ethnology classes as illustrations of types.

**Peasant Costumes** (Stillfilm, No. S-43, si, 29 frames). Photographs showing costumes of peasants of following countries, usually of groups engaged in typical occupation or activity: Slovakia, Hungary, Bulgaria, Austria, Greece, Germany, Holland, Sweden, Lapland, Russia, Lithuania, Latvia, Poland, Norway, Spain, Portugal, Mexico, Peru, Bolivia, Ecuador, Japan, Philippines, Formosa, Siam, Sudan, Palestine, and Egypt. Photographs carry name of country; no other captions or text. A good collection of photographs of peasant costumes. May interest elementary grades, as supplementary material, or dramatics classes in study of costume.

See also *Children of Many Lands* series for supplementary material.

**ECONOMIC AND INDUSTRIAL GEOGRAPHY****GENERAL**

**Ancient Machines in Use Today** (Stillfilm, si, 34 frames). Examples of primitive machines, such as the following, with data as to peoples using each today: bellows, mortars, primitive plows, water wheel, primitive irrigation pump, water lift, primitive looms and spinning machines, potter's wheel, primitive scales, sawmill, and grain mill. Suitable for use as supplementary material in elementary social studies, geography, and general science.

**Industries Group** (Filmette, 38 strips, si). The following filmstrips give a general overview of processes employed in the industries indicated in the individual titles. The films include some historical information concerning the development of the industry. Views of factories, mines, etc., are mainly of European industries. Identifying captions in German, French, and English. The films in

this group are suitable for use as illustrative material in junior or senior high school classes, and may be of interest in vocational schools. Individual titles follow.

- Construction of Light Railways (No. 6, 59 frames).
- Dredging Machines, Cranes, Shipbuilding (No. 7, 77 frames).
- Construction of an Ocean-Liner (No. 8, 103 frames).
- Power Station (No. 9, 79 frames).
- Precious Metals (Extraction and Dressing) (No. 10, 66 frames).
- Precious Metals (Historical—Manufacturing of Gold and Platinum, How a Piece of Jewelry Is Made) (No. 11, 71 frames).
- Precious Metals (Manufacturing of Silver. Molding) (No. 12, 73 frames).
- The Silk Worm (No. 18, 57 frames).
- Flax (No. 19, 74 frames).
- Linen Industry (No. 20, 62 frames).
- Cotton Spinning and Weaving (No. 21, 80 frames).
- Carpet Weaving (Knot Carpets, Velvet Carpets, Jaquard) (No. 22, 68 frames).
- Lime Kiln (No. 23, 47 frames).
- Quarrying Limestone (No. 24, 55 frames).
- Cement Manufacturing (No. 25, 63 frames).
- Marble Quarries (No. 26, 72 frames).
- Porcelain Manufacture (No. 27, 82 frames).
- Plate Glass Manufacture (No. 28, 81 frames).
- Crystal and Round Glass Manufacture (No. 29, 69 frames).
- Cutting and Preparing Timber (No. 30, 59 frames).
- Manufacture of Paper (No. 31, 44 frames).
- Coal Mining (No. 32, 57 frames).
- Lignite (No. 33, 80 frames).
- Gas Manufacture and Coke Works (No. 34, 71 frames).
- Paraffin Industry I (Petroleum Districts) (No. 35, 48 frames).
- Paraffin Industry II (Refining Works, Reservoir Plant) (No. 36, 64 frames).
- Milling (No. 37, 67 frames).
- Bread Making (No. 38, 51 frames).
- Beet Sugar Manufacture (No. 39, 67 frames).
- Sugar Refinery (No. 40, 71 frames).
- Common Salt Extraction (No. 41, 68 frames).
- Rock Salt Extraction (No. 42, 53 frames).
- Manufacture of Malt (No. 43, 50 frames).
- Methylated Spirits Distillery (No. 44, 43 frames).



**Brewing** (No. 45, 55 frames).

**Manufacture of Leather** (No. 46, 70 frames).

**Potash** (No. 47, 69 frames).

**Nitrogen** (No. 48, 65 frames).

**United States Geography** (Foley and Edmunds, No. V-051, 5 filmstrips, si, guide). The entire kit contains, in addition to the 5 filmstrips, the following material: charts, map, diorama, still pictures, and teacher's guide. The strips may be purchased either as a part of this kit or separately.

General information about four industries, each in a different section of the country. The material is suitable for use in the lower elementary grades. Individual titles with brief descriptions follow.

**A Trip Through the United States** (42 frames). A pictorial journey from New York City through the following regions with photographs of the type of industries in each: Northeastern, North Central, Northwestern, Southwestern, South Central, and Southeastern. May be of interest as an introductory unit.

**The Corn Industry** (26 frames). Opens with photographs of a child eating corn and of animals eating corn. Information about corn as learned from the Indians. Map of corn-raising areas and of hog belt. Various scenes of processes in raising corn from planting to storage, followed by a few shots of mill. Ends with chart of the uses of corn.

**The Cotton Industry** (30 frames). Opens with photographs for viewers to identify uses of cotton in a home and in an office. Map of cotton areas followed by scenes of activities in raising cotton from preparation of soil to picking. Boll weevil discussed. Processes in gin and textile mills shown. Some data at end on changes in the industry through modern machines. Several questions for class participation.

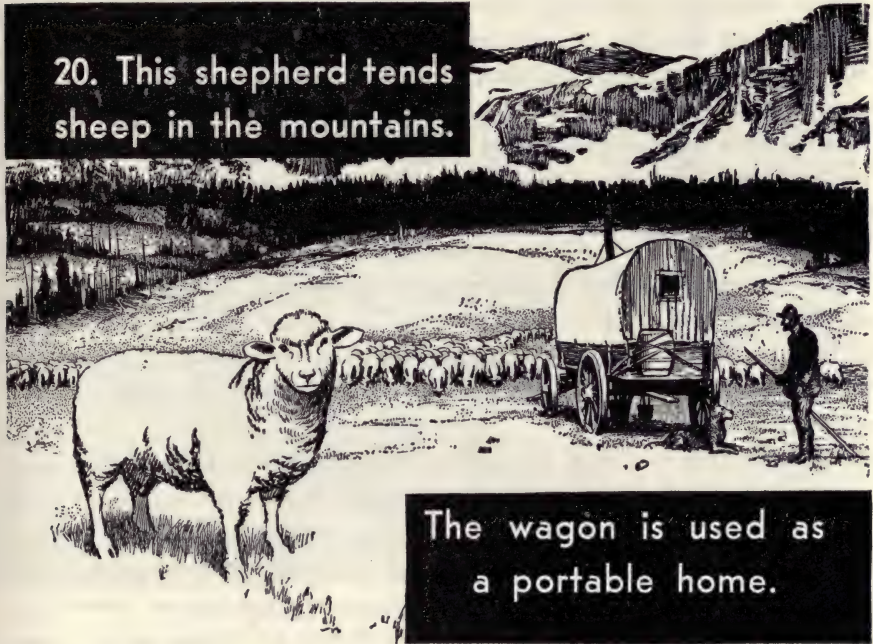
**The Lumber Industry** (32 frames). Map of lumber-producing areas, followed by scenes showing lumbering activities and methods of hauling lumber and logs. Views of preparation for use in sawmills. Ends with sequence on methods of conservation of lumber supply. Some questions for class participation.

**The Coal Industry** (27 frames). Map of coal-producing areas followed by scenes of coal mining, of breaker, and of coke as a by-product. Ends with chart of "what we get from coal." Some questions for class discussion.

## AGRICULTURE

**Day on the Farm** (ACE, No. 11, si, 50 frames, lecture notes). Uncaptioned photographs portray typical activities on a farm in eastern United States from breakfast and morning chores to evening rest. Indicates tasks performed by each

member of the family; stresses provision of own foods; and indicates importance of correct diet. Suitable for use in elementary grades social studies. Since photographs are not captioned, the strip can be adjusted to class needs easily and may be used for storytelling or composition by members of class.



From filmstrip "The Farm." (Informative Classroom Picture Publishers, Inc.)

**Desert Harvest** (Eye Gate, si, 32 frames). Importance of cultivation of spineless cactus; its use as cattle food; simplicity of planting. Supplementary material for elementary or junior high school classes. May also interest classes in agriculture and nature study.

**The Farm** (Informative, si, 21 frames, manual). Reproductions of line drawings, each with brief identifying caption, showing early farming methods, foods in properly regulated diet, and the source of each type with views of fields, ranches, etc. Ends with farm plan showing location of various buildings and fields. Each frame contains much detail or several scenes, reducing legibility. Suitable for use as basis for discussion in elementary grades. Manual provides text material for early elementary grades and for later elementary grades.

**Farming in Idaho** (Stillfilm, No. G-127, si, 32 frames). Opens with map of Idaho; topographic information on regions of state; major cash crops of each region; extent of irrigation. Suitable for elementary grades.



**General Farming** (SVE, 2 parts, si). Part I (65 frames). Emphasizes farmer's need for variety of skills and knowledge. Defines extensive and intensive farming. Shows work of an extensive farmer in calendar form, indicating activities from March through July.

Part II (83 frames). Continues the calendar of farming activities, and provides general information concerning improvements in farm techniques, special crops, work of farm managers and laborers. Ends with sequence on general qualifications, working and living conditions, advantages and disadvantages of farming as a career. Part I and first portion of Part II suitable for use in elementary and junior high school social studies to supply general picture of farmwork. Both parts suitable for junior and senior high school vocational guidance groups.

**Growing and Marketing Fruits** (Eye Gate, si, 107 frames). General overview of fruit farming in the United States, providing photographs of orchards, harvesting, transport to market, nurseries, storage methods. Some data on growth of trees and climate required. No technical data; good summary of the scope of fruit farming in this country. Photographs include material that instructor could expand if desired by class needs. Suitable for elementary and junior high school classes.

**Plants** (Filmette, No. 98, si, 98 frames). Photographs of fields and plantations in many parts of the world with some close-ups of food or fiber plants being raised. Includes many kinds of fruits, vegetables, cereals, spices, fiber plants, etc. Brief captions in French, German, and English identify the plant and the area in which the picture was taken. Suitable for use in elementary or junior high school classes to show wide range of plant production for various needs of man.

**The Story of Cotton Growing** (Eye Gate, 2 parts, si). Part I (70 frames) opens with graph of world cotton production. Major part indicates various activities in raising of cotton, ginning, baling, and transportation. Some information on importance of Eli Whitney's gin. Part II (84 frames) shows processes in making of cotton cloth, explains warp and woof. Ending sequence shows examples of hand-woven fabrics. Suitable for use in elementary social studies or geography. The two parts may be used together or independently.

**The Story of Wheat** (Eye Gate, 2 parts, si). Part I (90 frames) shows the activities in wheat raising from preparation of soil to harvest and transport to elevators. Information on development of machinery used.

Part II (67 frames) indicates methods of transporting wheat, processes in flour mills, and some scenes of home breadmaking. Both parts suitable for use in elementary grades; may be used together or separately.

**Vegetable Growing for City Markets** (Eye Gate, si, 100 frames). Operations required in the raising of various kinds of vegetables on truck farms. Shows

methods of transport to markets and several types of markets. Includes views of fields and close-ups of vegetables being grown. Suitable for use in elementary grades, social studies, or geography. Useful in teaching identification of vegetables.



From filmstrip "Building Stone." (*Eye Gate House.*)

## BUILDING STONE

**Building Stone** (*Eye Gate*, si, 101 frames). Photographs and text frames alternate, presenting examples of early uses of building stone, of modern structures, and sources of stone. Views of work in quarries, different kinds of quarries, machinery used; work in mills finishing the stone. Uses of marble, limestone, granite, sandstone, and slate. Examples of statuary and monuments. Very long with much text material. Suitable for use in upper elementary classes if instructor explains some of the terms used in the text frames.

**Lime and Clay Products** (*Eye Gate*, si, 72 frames). Text frames and photographs alternate, presenting uses of concrete, processes of making cement and building with cement, of making brick, uses of bricks; of making tiles and pottery, examples of uses. Text frames contain much material, reducing legibility. Sequences on tile and pottery better than others in strip, presenting considerable interesting detail particularly about handwork in finishing and decorating. Suitable for upper elementary grades.



**Marble Production** (Stillfilm, si, 32 frames). General survey of marble production, showing cutting methods and machinery in open and underground quarries, processes in mills, skill of marble cutters, and uses of marble. Suitable for use in elementary and junior high school classes. Emphasis on careful workmanship and skill in marble finishing shown in this strip is not contained in others on the same subject.

**The Story of Marble** (Eye Gate, si, 84 frames). Text frames and photographs alternate, presenting uses of marble, data on qualities, activities in quarries, processes in finishing, and hand carving. Text frames tend to be lengthy. Pictorial material, particularly of quarries, is good. Suitable for use in elementary grades although text vocabulary is advanced.

## COAL

**Coal Mining** (Eye Gate, si, 46 frames). Explanation of surface and subsurface mines. Series of drawings showing arrangement of subsurface mine—development of shafts, ventilating, installation of machinery. Photographs of “worked-out” mine. Comparison of coal supply in United States with New York City in size. Suitable for upper elementary or junior high school classes. Comparison sequence at end mentions the “war,” apparently the First World War; last two frames mention patriotism of miners who worked underground during war. These last two frames may be omitted if desired.

**Coal Mining** (Stillfilm, si, 30 frames). Opens with map of coal-producing regions in United States and Canada. Shows buildings and machinery at coal mines; mining processes; need for precautions and safety measures; grading and shipment of coal. A good short survey of mining methods suitable for use in elementary grades. Emphasis on safety measures makes this strip different from others on same subject.

**Coal Mining Industry** (SVE, si, 30 frames, manual). Uncaptioned photographs showing processes in coal mining; cleaning, grading, testing, and transport of coal. Includes sequence on making of coke. Suitable for use in upper elementary grades. Information of type supplied in manual is needed to make strip meaningful, since views are not identified in the strip. More detail on processes than above two strips.

**The Story of Coal** (Eye Gate, 2 parts, si). Part I (101 frames) opens with explanation of origin of coal, photographs of lignite to show resemblance to wood, and of fossil evidences of coal plants. Rest of strip shows processes in surface and subsurface mining; use of breakers and tipples; grading of coal. Part II (72 frames) is concerned mainly with transportation of coal: various methods shown, including loading of ships and railroad cars, use of trucks. End sequence

shows some of the uses of coal and various coal forms such as coke and briquettes. The two parts may be used together or separately. Both are very long with lengthy text frames. Part I includes much detail on mining processes. Suitable for upper elementary and junior high school classes. Opening sequence of Part I may interest general science classes.

## FOODS

### Canning

**What Food Canning Means to Us** (Long, si, 57 frames). History and development of food canning; modern canning processes and effect on modern living. Indicates sources of food, showing fields and gardens where produced. Stresses cleanliness in canning processes. Includes questions for class participation. A good summary of food-canning industry and its importance, suitable for upper elementary and junior high school classes.

### Fish and Seafood

**Canadian Fishing** (Stillfilm, si, 30 frames). General survey indicating the extent of fishing in Canadian waters. Shows types of boats and fishing methods used in deep sea, coastal, and inshore fishing; indicates kinds of fish caught. Oyster fishing, fresh-water fishing, whaling stations, and salmon canneries included. Suitable for intermediate and upper elementary grades.

**The Codfish Industry** (Eye Gate, si, 84 frames). Opens with map showing location of codfish banks and importance of industry to Massachusetts. Activities of fishermen, types of boats used, cleaning, salting, and drying methods; processes in codfish plants; shipment methods; importance of cod-liver oil. Ends with views of codfishermen in other countries. Good general survey of this industry for intermediate and upper elementary grades. Text frames tend to be lengthy.

**The Story of Fish** (Eye Gate, 2 parts, si). Part I (106 frames) presents information on types of fishing boats, activities of fishermen, types of fish caught, uses of different fish, preserving processes, transportation, and marketing. Good photographs of different kinds of commercial fish. Part II (111 frames) shows gathering, preparation for market, transportation, and marketing of different kinds of shellfish. The two parts may be used together or independently. Suitable for elementary or junior high school classes. May be of interest to nature study classes as supplementary material, *i.e.*, using close-ups of fish in teaching of identification.

**The Story of the Oyster** (SVE, si, 70 frames). Text frames and photographs alternate. Opens with indication of oyster areas of United States and statement



of their economic importance. Second sequence gives appearance and parts of oyster with some biological data. Rest of film shows planting of oyster beds, collecting, and moving to growing grounds, enemies of oysters, harvesting methods, grading, packing, methods of serving, value in diet. Very long with lengthy text frames. Good information on oyster-farming methods. Suitable for elementary grades although vocabulary is advanced. May also interest nature study classes or first-year biology or zoology.

**U. S. Fishing Industry** (Stillfilm, si, 30 frames). General survey indicating major types of seafood and fish caught for commercial purposes, with scenes of fishing methods, processing plants, and marketing. Suitable for use in intermediate and upper elementary classes.

**Whaling** (Stillfilm, si, 30 frames). General information on whaling including location, equipment, and boats, catching a finback whale, work in cutting shed, views of various parts of whales, and uses of whalebone and blubber. Supplementary material for elementary grades.

### **Fruits and Vegetables**

**Production of Tomatoes and Tomato Products** (Long, si, 66 frames, manual). First 45 frames show processes in growing of tomatoes for market and cannery, including fieldwork from preparation of soil to harvesting and shipment; insects and diseases, irrigation methods, several market types of tomatoes. Part II (21 frames). Procedures in tomato cannery, also production of catchup and tomato juice. Shipment of canned products and trucking of fresh tomatoes to markets. Photographs are uncaptioned; therefore information of type supplied in manual is required to make strip meaningful. A detailed survey of this industry suitable for upper elementary and junior high school geography. May also interest agriculture classes.

**Story of Pineapple** (Eye Gate, si, 72 frames). Opens with map of Hawaiian Islands and indication of their importance in pineapple production. Rest of film shows work in fields, packing and transport to canneries, processes in cannery, shipment by boat. Chart included showing what happens to each part of the pineapple in the canning process. A thorough survey of the pineapple industry, suitable for upper elementary or junior high school use.

### **Meat**

**The Food We Eat** (Stillfilm, No. 1, si, 34 frames). The story of link sausages from raising of hogs to preparation for eating. Includes raising of hogs, stockyards, and hog buyers; inspection, processes in packing plant, making of prepared

pork products; retailer; and cooking. Suitable for use as supplementary material in elementary classes.

**Production of Meat** (Eye Gate, si, 70 frames). Sheep, cattle, and hogs, indicating pasturing, winter care, and feeding processes; shipment to stockyards, procedures in packing house including government inspection; ends with shipment in refrigerated cars and handling by wholesalers and retailers. A general survey suitable for elementary classes.

## **Milk**

**Dairying—the Milk Industry** (SVE si, 78 frames). Opens with statement that milk is the natural food. Shows the five principal dairy breeds; procedures in preparation and distribution by large companies. Main emphasis on cleanliness required. Last sequence shows advantages of paper container. General survey suitable for use in elementary grades.

**Inspection and Distribution of Milk** (Eye Gate, si, 63 frames). Opens with inspection by city health officers as milk arrives at railroad terminal; examination by company experts. Delivery to retailers and private homes. Second part shows milk-distribution methods in other lands. Describes use of cream, use of separators, pasteurization. Supplementary material on milk industry for upper elementary grades, geography or hygiene classes.

**Production of Milk** (Eye Gate, si, 84 frames). Milk from care of dairy cattle on farm to delivery to consumer. Farm sequence includes inspection and cleanliness required. Sequence on milk station or creamery includes weighing, testing, pasteurizing, and bottling. General survey suitable for elementary grades.

**Quality Milk from Farm to You** (Eye Gate, si, 75 frames). Part I discusses processes on dairy farm including health examinations, cleanliness, and use of milking machines. Part II shows processes at a modern city milk plant, including pasteurizing, bottling, and delivery. Ends with indication of care of milk in the home, milk services in schools, and the healthful qualities of milk. A general survey suitable for elementary grades.

## **Sugar and Maple Products**

**Production of Maple Sugar and Syrup** (Eye Gate, si, 62 frames). Views of maple grove; processes in tapping, equipment used, hauling sap, the saphouse, making of syrup and sugar, packing in cans and bottles, molding of maple sugar, sugaring off, uses. Suitable for elementary or junior high school classes. More information on actual processes than in "Tapping the Maples." Women's clothing and hairdress shown in last sequence much outdated.



**Story of Sugar** (Eye Gate, si, 94 frames). Part I surveys beet-sugar production from field to refinery processes. Part II discusses cane sugar from plantation to refinery processes. Both indicate areas where beets or cane are raised; type of products; uses. A good survey of the sugar industry for elementary or junior high school classes.

**Tapping the Maples** (Eye Gate, si, 34 frames). Photographs in the Adirondacks during maple-sugar season, showing tapping methods, gathering of sap, bottling of sap, making taffy. Suitable as supplementary material in lower elementary grades.

### **Other Foods**

**The Coffee Industry** (SVE, si, 29 frames, manual). Uncaptioned photographs showing various aspects of the coffee industry, including work on plantation, storage, shipping, testing, blending, roasting, and packing. Needs information of type supplied in manual to make strip meaningful. Suitable for use in elementary grades.

**How Bread Is Made** (Stillfilm, si, 37 frames). General survey of breadmaking in large bakery from harvesting of wheat and flour making to truck shipments of loaves. Suitable for elementary grades. Considerable text material.

**Rice, an Important American Industry** (SVE, si, 29 frames, manual). Uncaptioned photographs showing processes in the raising of rice. Needs information of type supplied in manual to make strip meaningful. Suitable for use as supplementary material in elementary grades.

**Story of Cocoa and Chocolate** (Eye Gate, si, 71 frames). Opens with sequence on origin of cacao tree in the Americas and its spread to other lands. Processes in gathering and opening of pods, drying, and shipments of beans. Processes and equipment in chocolate factory showing various products made; uses indicated. Suitable for use in elementary and junior high school classes. Good general survey. Clothing and hairdress shown outdated.

**The Story of Salt** (Eye Gate, si, 72 frames). Various operations in mining of salt; preparation of rock salt, table salt; uses of salt. Good general survey suitable for use in elementary and junior high school classes. Some clothing and hairdress shown is outdated.

### **LUMBERING AND WOOD PRODUCTS**

**How the Forest Serves Man** (Eye Gate, si, 75 frames). General survey of forests and logging showing woodland areas, fire fighting, recreation facilities, lumbering activities, processes in sawmills and lumberyards, uses of cutover land for farm crops. Suitable for use in elementary grades. Does not show all processes in either lumbering or sawmills.

**Lumber Production** (Stillfilm, si, 30 frames). Processes in the preparation of lumber, including sawmill equipment and processes; explanation of "quarter-sawed log," heartwood, sapwood; methods of steaming to change color, finishing of boards, trimming, grading, sorting, seasoning, kiln-drying. Good general



From filmstrip "Lumber Production." (Stillfilm, Inc.)

survey for upper elementary or junior high school geography or social studies. May also interest some elementary woodworking classes as supplementary material.

**Plywood Manufacture** (Stillfilm si, 34 frames). Processes in manufacture of plywood from views of commercial stands of Douglas fir and information about its adaptability for plywood, through logging to finish plywood. Indicates uses of plywood. Mentions characteristics and advantages of plywood for various types of construction. Suitable for use in upper elementary and junior high school geography or social studies. May interest elementary woodworking groups as supplementary material.

**Wood Structure** (Stillfilm, si, 32 frames). General information concerning the structure of wood and lumber trees. Identifies cross section, sapwood, heartwood, sap ducts, medullary rays. Defects of trees making wood unusable for lumber. Photographs of various kinds of trees with information as to their uses as lumber. Good general survey of tree structure and commercial lumber types. Suitable



for use in elementary and junior high school geography or social studies. May be of interest as supplementary material in elementary woodworking classes or in nature study classes.

**Wood Utilization** (Stillfilm, si, 30 frames). Summary of the economic importance of development of wood-product research. Shows percentage of wood used for lumber by building trades; uses of softwoods and hardwoods; uses of wood previously burned as waste; forest-products laboratory and tests of wood products. Suitable for use in elementary and junior high school geography and social studies classes. May interest elementary science classes as supplementary material.

## **METALS**

**Gold and Gold Mining** (Stillfilm, si, 34 frames). Opens with explanation of uses as standard of value; bullion, nuggets. Sequence on ancient uses of gold with examples of ornaments. Uses of gold today. Last sequence shows location of gold mines, mining methods, and processing. Good general survey suitable for use in elementary geography or social studies.

**Iron** (Stillfilm, si, 31 frames). General information on mining of iron; shows both open-pit and underground mines; ore boats; processes in production of pig iron. Includes map of world iron deposits and data on standing of United States in iron production. Suitable for use in elementary geography or social studies. Other filmstrips on this subject provide more detail on processing methods.

**Iron and Steel Series** (Filmette, 5 strips, si). The various processes in mining and processing of iron and steel, including types of ores, combustibles and fluxes, forging, rolling, pressing, casting, and laminating. Some diagrams of various types of furnaces and machines. Photographs include a number of the large iron and steel mills of Europe. The last filmstrip summarizes the information in the unit, presenting the most important methods shown in the preceding films. Brief identifying captions in German, French, and English. Suitable for upper elementary or junior high school classes. May interest general science classes as supplementary material. Individual titles are listed below.

**Ores, Combustibles, Metallic Fluxes** (No. 1, 67 frames).

**Producing Raw Iron** (No. 2, 76 frames).

**Steel** (No. 3, 94 frames).

**Forging, Rolling, Pressing, Casting, Laminating** (No. 4, 77 frames).

**Summary Iron and Steel** (No. 5, 104 frames).

**The Metals Series** (SVE, 6 films, si, manuals). Uncaptioned photographs showing various processes in the mining and processing of the metal indicated by the individual titles. Information concerning various uses and products is included.

Some historical data, especially early uses of the metal, are shown. Information of the type provided in the manuals is needed to make the strips meaningful. Suitable for use in elementary or junior high school classes and may interest general science classes as supplementary material. Individual titles are listed below.

**Aluminum** (50 frames).

**Copper** (49 frames).

**Gold and Silver** (42 frames).

**Iron and Steel** (51 frames).

**Lead** (51 frames).

**Zinc** (47 frames).

**Steel** (Stillfilm, si, 40 frames). A general survey of mining and processing methods, with uses of steel in construction indicated. Shorter than most other filmstrips on the same subject, information on major processes but less detail. Suitable for use in elementary classes.

**The Story of Copper** (Eye Gate, si, 87 frames). Processes in mining, smelting, molding, and refining of copper. Uses of copper in telephone and electric wires; other uses. Suitable for use in elementary geography or social studies. Considerable amount of text.

**Story of Iron and Steel** (Eye Gate, si, 87 frames). Survey of steel industry showing mining methods, transport in ore boats, production of pig iron, wrought iron and steel showing Bessemer process, electric furnace, open-hearth process, scenes in steel mills and foundry, uses, methods of hardening. Suitable for elementary or junior high school geography or social studies. May also interest general science classes as supplementary material. Quite long for one class session and considerable text.

**The Story of Steel** (ACE, No. 41, si, 46 frames, lecture notes). Survey of steel manufacturing in the Pittsburgh area. Views of typical operations, including Bessemer converter, open-hearth furnaces, smelting iron ore, testing in laboratories, rolling processes—continuous and conventional mills—making “tin” cans, inspection, making stainless steel, use of electric furnaces, steels for special uses. Examples of many products obtained from iron—hypodermic needles to streamlined trains—and importance of steel in modern civilization. Indicates sources of raw materials. A good general survey of the steel industry, suitable for junior or senior high schools. Could have included more data on worker’s life and problems of the industry. Filmstrip consists of uncaptioned photographs; lecture notes supply information.

**The Story of Sulphur** (Eye Gate, si, 61 frames). Part I shows native sulphur, commercial sulphur, and various laboratory experiments with sulphur. Part II



shows processes of extracting sulphur. Part I suitable for beginning science classes; part II suitable for geography or social studies. Neither part provides complete information on the aspect of sulphur being treated.

**What Iron and Steel Mean to Us** (Long, si, 69 frames). Opens with discussion of importance of iron and steel to man and modern civilization. Second section shows the principles of iron and steel manufacture from mining to finished products. Stresses uses of steel, particularly in transportation, construction, in homes, and in tools. Good general survey of the industry, suitable for elementary or junior high school classes. Questions for group participation.

### PAPER AND PRINTING

**Book Manufacturing** (Stillfilm, si, 29 frames). General processes in book manufacturing shown from setting of type to shipment of finished books. Suitable for elementary grades geography or social studies.

**Manufacture of Paper** (Eye Gate, si, 112 frames). Processes in paper manufacture, from logging and production of pulp to finished products. Indication of various uses of paper. Very long for showing during one class session. Some of the processes shown may now be outdated.

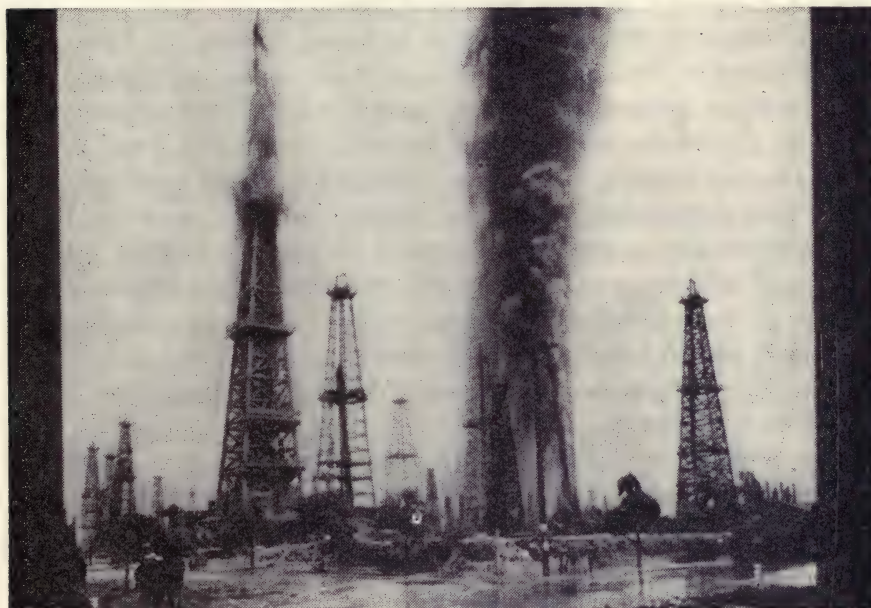
**Modern Newspaper** (Stillfilm, si, 28 frames). General survey of steps in production of a newspaper. *New York Herald Tribune* is used as an example. Chart shows "gravity" system—operations beginning on top floors and proceeding down through various departments to street floor. Views of work in the various departments from city room to delivery room. Shows major production steps briefly. Suitable for use in elementary grades.

**Paper Manufacturing** (Stillfilm, si, 30 frames). General survey of major steps in paper manufacturing from types of wood used to finished product. Suitable for use in elementary grades.

### PETROLEUM

**Oil in America** (ACE, No. 36, si, 50 frames, lecture notes). The story of oil in the United States beginning with primitive uses of oil, as an early nuisance in wells, use as patent medicine, the kerosene age, first oil well, and early refining methods. Effect of invention of motorcar. Growth of oil production. Location of oil fields, modern methods of refining, the many products and importance of oil to modern civilization. Information on methods of finding oil, well drilling, transport of oil. Indicates needs for conservation. Good outline of development, importance, processes, and problems, covering many aspects of this industry. Uncaptioned photographs, maps, and graphs; lecture notes supply information. May also be of interest in classes on economic problems.

**Petroleum** (Stillfilm, 2 films, si, about 30 frames each). Part I shows the various processes in petroleum production at wells and methods of transportation. Some information on importance of petroleum, world producing areas, and status of North America in production. Part II shows the processes in refining, indicates various products and their uses. Suitable for use in elementary grades. Major stress on importance of petroleum products to modern civilization.



From filmstrip "Petroleum and Gas." (*Eye Gate House.*)

**Petroleum and Gas** (*Eye Gate*, si, 76 frames). Opening sequence indicates importance as commercial products; major oil fields in United States; first petroleum well. Views of processes in well digging, transport, refining. Various products and their uses. Very long and considerable text. Some processes in refineries have been improved since strip was made. Suitable for use in elementary geography or social studies. Might be of use as basis for opening discussion of petroleum products with instructor or class members adding to information given in strip.

**Producing and Distributing Gasoline** (SVE, si, 40 frames, manual). Uncaptioned photographs of activities at oil field and in refineries, ending with sequence on uses. Needs information of type supplied in manual to be meaningful. Suitable for use as supplementary material in elementary grades.



## TEXTILES AND CLOTHING

**Art of Rug Weaving** (Eye Gate, si, 52 frames). Survey of modern rug-weaving industry showing various processes at mill, designing of a rug pattern, weaving of various types of rugs, carpets, and tapestries. Some mention of Mohawk products as photographs were taken at the Mohawk Carpet Mills. Photographs of various machines and processes not labeled and would require additional information to be supplied by instructor. Suitable for use as supplementary material in elementary or junior high school classes.

**Cotton Textile Industry** (ACE, No. 37, si, 44 frames, lecture notes). Opens with data on raising of cotton and location of cotton belt in the United States. Historical sequence indicates development of cotton industry, inventions and their effects on the industry and on lives of workers. New England shown as first center of cotton industry. Development of textile mills in the South indicated. Shows types of operations, workers, and working and living conditions. Home and industrial uses of cotton. Importance as an export and in the national economy. A good survey of the history and development of this industry and of modern processes. Indications of importance of this industry well presented. Could have presented more information concerning the problems of the textile industry. Filmstrip consists of uncaptioned photographs and some maps; lecture notes provide information.

**History of Weaving** (Eye Gate, si, 51 frames). Begins with statement of basic principle of all weaving. Photographs of early weaving devices and fabrics made on these looms, such as Peruvian two-stick loom, prehistoric North American hand looms, Viking hand looms, Indian hand loom of today. Operation of modern hand loom and modern power loom. Not a complete history, but shows some of the ancient hand-loom methods clearly. Suitable for use as supplementary material in elementary and junior high school classes. May also interest handicraft classes or clubs.

**On Every Hand** (Nat'l Assoc. Leather Glove Manufacturers, sd, 30 min, color, loan). The story of glove manufacture. Includes information on sources of hides used, differences in hides, tanning processes, grading of hides and of tanned leathers, block cutting, hand cutting, and table cutting; discussion of selecting gloves by intended use, stressing comfort, appearance, style, wear, and protection. Indicates reasons for different grades of gloves. A cartoon character of a South American tells the story. A very thorough résumé of glove manufacture. Introduction is long and narration tends to be rapid. Suitable for use in upper elementary or junior high school geography or social studies. May also interest domestic science classes.

**Silk Thread Manufacturing** (Stillfilm, si, 30 frames). General survey showing removing filaments from cocoon, skeining, processes in thread factory, and display by retailers. Indicates China and Japan as major sources of raw silk. Suitable for use in elementary social studies or geography classes. Some of the text frames are quite long.

**Story of Rayon** (SVE, si, 29 frames, manual). Uncaptioned photographs showing various processes in production of rayon, including raw materials, making thread, spinning, and testing. Needs information of the type supplied in the manual to make the strip meaningful. Suitable for use as supplementary material in elementary grades.

**Story of Silk** (Eye Gate, si, 103 frames). First sequence concerns the silk worm: appearance, care, feeding, cocoon formed, development and emergence of moth, laying of eggs. Second sequence shows processes in production: removal of filaments from cocoons, skeining of raw silk for shipment; processes in silk factories; uses of silk. Suitable for use in elementary or junior high school social studies or geography. First part may interest nature study classes also. A few photographs in the end sequence on uses show outdated clothing.

**Story of Wool** (Eye Gate, si, 69 frames). Opens with indication of United States and Australia as major sources of wool. Processes in shearing, packing, and transport of fleeces; processes in mill from sorting and grading to finished products. Includes hand processes in spinning and weaving, work of tailors, and processes in large clothing factories. Good survey of wool and woollen products. Suitable for elementary or junior high school classes. Some text frames are quite long.

**Textile Industry—Blanket Manufacturing** (Stillfilm, si, 32 frames). Major processes in production of blankets, from raw materials to finished product. Suitable for use as supplementary material in elementary grades.

## TRANSPORTATION AND COMMUNICATION

**The Aeroplane and Historical Development** (Filmette, No. 13, si, 128 frames). History of the development of the airplane, beginning with early theories and legends to planes of the 1930's. Includes many European types and models; facilities of Berlin airport; air views of European cities and map of commercial routes; seaplanes, and diagrams of construction. Identifying captions are in French, German, and English. Suitable for study of transportation in junior or senior high schools. Material is that existing prior to the Second World War.

**Airships and Historical Developments** (Filmette, No. 14, si, 81 frames). History of the airship, balloons and dirigibles, from early types in 1800 to Zeppelins.



Includes mainly European types. Sequence on Zeppelins includes drawings and photographs of framework construction and of passenger cars. Identifying captions are in French, German, and English. Suitable for study of history of transportation in junior or senior high schools.

**Air Transportation Series** (United Airlines, SVE, 7 films, si, manuals, loan). The strips in this series present various aspects of air transportation from general flight information for lower elementary grades to information on meteorology and global concepts for senior high school and college use. Individual titles with brief descriptions follow.

**Behind the Scenes of a Coast-to-Coast Flight** (56 frames). Part I presents maps of global routes, U.S. airline routes; statistics on amount of freight, mail, and express carried; examples of early commercial planes with data on weight, size, speed, etc.; the "Mainliner"—cutaways showing arrangements and parts. Part II shows the details of a coast-to-coast flight, including plane personnel and their duties, views of country flown over, control board, use of radio, food preparation, preparation of plane, various airports. Good general summary of requirements for flight. Suitable for upper elementary grades or junior high school.

**Coast-to-Coast—Geography from the Air** (55 frames). Opens with maps showing airplane routes, physical map of U.S., agricultural regions, and annual precipitation. Major part of strip shows air views of cities and regions seen during coast-to-coast flight; each identified briefly. Suitable for use in elementary or junior high school classes. May be of interest as incentive for map practice, also.

**Seeing the Airport** (34 frames). The story of a visit to an airport by two children showing the various airport facilities, including activities in terminal building, control tower, weatherman and his instruments, hangars, checking of planes, Link trainer, runway markers and lights, air-conditioning unit, meal-service truck; short flight, showing interior of plane, stewardess, air views of airports. Good summary of airport facilities. Suitable for lower elementary grades.

**Meteorology and Navigation** (23 frames). Shows various meteorology instruments used, each identified and purpose stated. Diagrams of cold and warm fronts, weather maps, formation of fogs, of thunderstorms, of icing conditions. List of terms used in navigation defined. Problem in dead reckoning with solution. "Mainliner" antenna system, flying radio highways, instrument procedures. Suitable for high school and college classes in meteorology, physics, and beginning aeronautics.

**Global Concepts and the Age of Flight** (24 frames). Examples and brief

explanations of early maps, including Ptolemy map of A.D. 150; Diego Ribero's world map of 1529; modern maps of Eastern and Western Hemispheres; development of a Mercator chart, of Lambert conic chart, polyconic chart, gnomonic chart, North Polar centered Azimuthal projection, U. S. centric world map. Maps of proposed global airlines. Chart of comparative travel times around the world; distances by air to various cities from New York; shrinkage



From filmstrip "Night and Day." (*The New Haven Railroad.*)

of world due to air-transport developments and its influence on industry and human relations. Suitable for high school and college classes in social science and principles of geography and cartography. May also interest classes in beginning aeronautics.

**Research Engineering—Aircraft Development—Airports** (24 frames). Research-engineering sequence includes purpose, work, tests made, electric-instrument research, testing equipment. Development sequence shows post-war plane, the "Mainliner" with data on weights, size, speed, etc., helicopters, flying-wing gliders, jet-propulsion principles. Airports sequence includes CAA classifications, air views of each class of airport, views of proposed new airports. Suitable for upper elementary and high school classes. May also interest classes in general science.

**Boulevards of Steel** (NY, NH & H, si, 108 frames, teacher's guide, loan). A study of passenger transportation presented as four reports by high school stu-



dents. (1) **Passenger Train Operation:** types of locomotives, inspection, and repair; preparation of passenger cars; the crew; government of train movements. (2) **The Conductor:** duties, people he serves, reasons why people travel, problems confronted in caring for passengers, conveniences provided. (3) **Passenger Traffic Operation in Relation to the Community:** average number of people on typical train; crew and workers required, other costs. Division of costs among passenger fares. Scheduling. Importance of efficient service to towns on route. (4) **Serving of Meals:** commissary, work of stewards, preparation of dinner, standard recipe books, employees and duties. End sequence shows H. S. Palmer, president of company, speaking concerning distribution, wartime services, safety measures. Good background material on passenger transport for junior or senior high school. May be of interest also to vocational guidance groups.

**Bridges, History and Types** (Stillfilm, 2 films, si). Part I (32 frames, No. M-5) contains examples showing the development of bridges, including primitive suspension types, stone Roman structures, Scotch bridges using buttresses and keystones, early wooden bridges, covered bridges, first metal-arch type, early all-steel spans, classification of modern steel types. Part II (34 frames, No. M-6) shows examples of modern suspension bridges, arch bridges, cantilever, swing, reinforced-concrete bridge types. Suitable for use in upper elementary grades as supplementary material in geography, transportation, and architecture classes.

**City Thoroughfares** (Filmette, No. 141, si, 82 frames). Opens with air views of various European cities (and a few non-European) showing the maze of streets. Follows with views of typical streets in old sections of cities; views of famous streets, places, and squares in cities such as Berlin, London, Paris, Bagdad, Rio de Janeiro, Vienna, and New York. Identifying captions in French, German, and English. Interesting supplementary material for upper elementary social studies, geography, or study of transportation.

**Cost of Poor Roads** (Public Roads Admin., si, 53 frames, lecture notes). Indicates direct and indirect costs of poor roads, including effect on automobiles, adverse effect on farming and development of area, and costs to life and property. Describes benefits of good roads. While designed for promotion of road improvement, it may be of interest as supplementary material in classes studying modern transportation or in social science classes.

**Country Roadside Restored** (Public Roads Admin., si, 68 frames, lecture notes). Describes difference between modern highways and old country roads, indicating benefits and improvements. Suitable for use in junior and senior high school classes as supplementary material.

**Great Lakes Shipping** (Stillfilm, No. G-133, si, 28 frames). Résumé of shipping on the Great Lakes: amount of shipping, passenger and freight traffic, canal

system at Sault Sainte Marie, water fronts, and docks. Suitable for use in elementary classes.

**Highway Research Highlights** (Public Roads Admin., si, 69 frames, lecture notes). A brief outline of road research, reviewing early research methods, organization for research, accomplishments, and control tests. Suitable for senior high school study of transportation, and as supplementary material in American government or civics to illustrate government transportation services. May also be of interest to college classes in civil engineering.

**Highway Transportation—Miracle of Motorized America** (Nat'l Highway Users, si, 72 frames, manual, loan). Opens with importance of roads and their relation to degree of culture of a people; uses of highways in history, including Roman roads, roads in colonial America, use in the conquest of the West. Development of highways as needs for good communication increased. Effect of invention of automobile. Effect of better roads on standard of living, rural education, public health, fire protection, etc. Needs for greater highway safety. Changes since Pearl Harbor, use of highways for war purposes, workers connected with motor travel. Stresses importance of roads to civilization. Suitable for use in high school study of transportation and in social studies classes.

**History of Aeronautics** (Visual Sciences, si, 41 frames). Line drawings with brief text on same frame provide an outline history of aeronautics, showing major improvements and events from the legends of 1100 B.C. to 1943. Second part is concerned with U. S. military planes, providing examples of the various types used (such as trainers, bomber types, observation, pursuit, etc.) and indications of wing and tail markings of the Allies and of the Axis. The drawings are simple and clear; text brief enough for full legibility of both drawing and captions. The first sequence may be of value as a basis for introduction of fuller discussion of the development of aeronautics. The military plane sequence is of little teaching value in most school situations today.

**History of Transportation and Communication** (Young America, 4 films, si, teacher's guide). These four filmstrips summarize man's development of land, water, and air transportation methods and of communication methods. All except the strip on air transportation include provision for class participation through questions and suggestions for discussion. The material is necessarily brief, presenting only the major steps or achievements. It is suggested that the connection between development of land, water, and air transport methods be indicated to the group, since the strips do not attempt to show even chronological comparison except by inclusion of dates; an over-all summary might be of interest. Although designed to supplement the producer's motion picture "Our Shrinking World," these filmstrips may be used without the movie and in any order indi-



cated by class or curriculum needs. This series is suitable for use in upper elementary or junior high school social studies, history, or general science. Individual titles with brief descriptions follow.

**History of Land Transportation** (48 frames). Land-transportation methods from times of cave men to present, pointing out how inventions have decreased travel time and given man larger knowledge of world. First sequence—early methods to discovery of wheel. Second sequence—how invention of wheel changed transportation methods. Third sequence—major developments in last 150 years. Fourth sequence—motor-vehicle development and aid to industry and agriculture. Ends with photo quiz.

**History of Water Transportation** (39 frames). Major developments from early ages to present, indicating uses of inventions in overcoming geographical barriers. First sequence—early rafts and dugouts, sailing vessels. Second sequence—development from clippers to modern ocean liners and freighters. Ends with photo quiz.

**History of Air Transportation** (42 frames). Development from man's early attempts to imitate birds to present. First sequence—legends, da Vinci's attempts. Second sequence—balloons and lighter-than-air craft. Third sequence—heavier-than-air craft, gliders and planes, ending with flight of B-29 to Washington from Tokyo in 1945.

**History of Communication** (48 frames). Development from sign language to radio and television, pointing out how people have become able to communicate almost instantly with anyone anywhere in the world and the importance of communication to industry and other human achievements and activities. First sequence—primitive communication. Second sequence—importance of printing. Third sequence—importance of electricity and effect on communications. Ends with photo quiz.

**How We Travel on the Train** (Stillfilm, No. S-39, si, 32 frames). Early and modern Pullmans compared; shows interiors both daytime and at night—drawing rooms, bedrooms, dining car, lounge car, twin-car unit, observation car. General information on appearance and use of Pullmans. Suitable as supplementary material in lower elementary grades. Strip does not include coach travel.

**It's Fun to Travel by Train** (NY, NH & H, si, 88 frames, teacher's guide, loan). Story of two children, Alice and Henry, on a train trip to New York including the entire trip from making plans to arrival in Grand Central Station. Describes train and various types of cars; shows crew and how they help passengers; describes safety and conveniences. Good general information about passenger-train travel and passenger trains for elementary grades. The name of the railroad appears in the film.

**Let's Make a Post Office** (Popular Science, si, 37 frames, color, teacher's guide). In story form Peter receives letter from father in Florida, mother grants permission for Peter to take stamp album to school. Classmates help Peter write a letter to his father: indicates proper addressing of envelope, placement of stamp, reasons for using stamps, three-cent stamps shown. Class goes to post office with mailman and sees place to mail letter, parcel-post window, buying stamps, canceling machines, sorting of mail, loading of trucks—trucks go to trains, airplanes, and boats. Class decides to make own post office; four pictures show the school post office and activities of children. Good information on letter writing and also on post-office services. Introduction is interesting but unnecessary to the strip, the stamp album in particular adds little except to indicate stamp collecting as a possible hobby. Very little material concerned directly with the title subject.

**Methods of Communication Series** (SVE, 11 films, si, 45–60 frames each). Elementary and nontechnical information concerning various methods of communication. Each filmstrip presents a number of photographs showing various operations, equipment, and uses of communication method indicated by individual titles. Information concerning history and development included. Recent developments may make it advisable for instructors using this series to supplement the information given. Individual titles follow.

Broadcasting—Outside

Broadcasting—Studio

Cables

Mail

Radio—Historical

Radio—Marine, Aviation, etc.

Sound Pictures

Telegraph

Telephone—Central Station

Telephone—Outside

Television

**Night and Day** (NY, NH & H, si, 81 frames). A survey of railway freight transportation, indicating particularly extent to which New England is dependent upon other regions for food and supplies and need for moving New England products to other areas. The following device used: high school instructor asks questions of class; answers by class or by instructor presented in pictorial sequences. Includes comparisons of freight and passenger locomotives, types of freight cars for various purposes, devices used to aid locomotives in starting long, heavy freight trains, make-up of a freight train, classification yards, use of the "hump," controls, assembly of loads that do not fill complete cars; truck and



trailer operations; meaning of transportation to New England. Stresses prompt, speedy service and importance of railway freight transport. Very long and considerable textual material. Sequences dealing with classification and methods of handling trains are well presented. Although the strip deals mainly with freight as related to New England's problems, it could be adapted by discussion to freight problems of other areas. Little advertising other than the company name as it appears on the sides of freight cars.

**Railroads at Work** (Castle, si, 75 frames, color, teacher's guide). A general survey of American railroading with information on history and development, services, importance to agriculture, food distribution, livestock distribution, manufacturing and mining, military uses, freight and express services, safety, travel conveniences, and types of vocations in rail transportation. Very long and treats briefly a number of different aspects. This may prove confusing if the strip is used in lower elementary grades. Pictorial material in general is very good. No captions or text are used in the strip. The manual reproduces the frames of the strip, providing three lecture paragraphs for each. If paragraph 1 only is read, 14 minutes will be required; if paragraphs 1 and 2 are read, 28 minutes; and if all three are read, about 40 minutes. The vocabulary of the lecture supplied in the manual is suitable for upper elementary grades. However, since the film itself contains no text, it can be adapted for use on any grade level interested in its subject matter through the teacher's own comments.

**Railroad Family** (ACE, No. 35, si, 41 frames, lecture notes). Photographs showing life and home of railroader's family and scenes of his work. Lecture notes provide information. Includes locomotive engineer's activities on day off and his family; activities during day of work—in dispatcher's office, checking watch, checking locomotive, stress on safety, work of other train-crew members, use of signals. Ends with engineer attending meeting of an organization of railroad men. Suitable for use in intermediate elementary grades. May interest high school social science classes or vocational guidance groups as supplementary material.

**Railroad Transportation** (ACE, No. 34, si, 37 frames, lecture notes). Photographs showing development of railroads and U.S. railroad systems, effect on development of the West, modern trains and train service. Lecture notes provide information. Stresses importance of railroads in modern economic life. Suitable for use in upper elementary and high school study of transportation and social studies.

**River Crossings** (Filmette, No. 142, si, 78 frames). Photographs of famous bridges in various countries, including both modern and ancient bridges. Also shows other methods of crossing rivers, such as fording. Brief identifying captions

in French, German, and English. Interesting supplementary material for elementary or junior high school social studies, geography, and study of transportation. **Roads and Roadmaking** (Eye Gate, si, 98 frames). Stresses importance of good roads and provides examples of unimproved and improved roads. Indicates problems in planning routes of new roads, need for safety factors; shows methods of leveling; processes in making sand-clay, gravel, macadam, asphalt, concrete, and brick roads. Indicates need for constant maintenance. May interest elementary or junior high school classes as supplementary or historical material. Shows outdated automobiles; machinery used today and processes of present differ in some respects.

**Seaports and Canals** (Filmette, No. 144, si, 108 frames). Photographs of various seaports and canals in different countries showing activities. Contrasts modern and ancient ports and canals. Brief identifying captions in French, German, and English. Suitable for use as supplementary material in elementary and junior high school social studies and geography.

**Telephone Industry** (Stillfilm, si, 32 frames). Survey of the development of the industry from Bell's invention to modern developments such as teletypewriter, telephony, etc. Includes importance of industry today, map of U.S. toll lines, extent of use, work of pole crews, etc. Very general survey with main emphasis on telephone as necessity in modern civilization. Suitable for use in elementary classes.

**Transportation** (Informative, si, 20 frames, manual). Reproductions of line drawings, each with brief identifying captions, showing various methods of land, water, and air transportation from man's first boat to modern planes. Information provided is incomplete since only a few of the major developments could be shown. Suitable for supplementary use in elementary grades. Each frame contains considerable detail.

**Transportation Series** (Stillfilm, 8 films, si, about 30 frames each). General information concerning the development of transportation methods. Text and photographs alternate; text tends to be lengthy. Suitable for use in elementary grades. Individual titles with brief descriptions follow.

**Transportation—Water** (3 films).

Number I (No. X-13). Historical development from hollowed log to modern ocean liners and battleships. Only major developments shown.

Number II (No. X-14). Examples of primitive and modern methods of freight transport.

Number III (No. X-45). Examples of modern freight transportation by sea and on inland waterways. Also shows battleship and submarine.



**Transportation—Land (2 films).**

Number I (No. X-14). Historical development of land transportation showing major developments.

Number II (No. X-43). Various methods, stressing the primitive and the unusual.

**Transportation—Air (No. X-44).** General survey of airplane development up to the Second World War.

**Ocean Freight (No. M-4).** Activities involved in shipping freight; including information on foreign trade, definition of cargo, loading and unloading, equipment used, workers.

**Across the Pacific by Air (No. G-188).** Story of a Clipper trip across the Pacific: map of Pacific air routes and U.S. possessions; views of plane and crew. Scenes of stops along the way with data on distances, size, and elevations, products of some of the islands; sea birds.

**Transportation Series (Eye Gate, 7 films, si, 60–100 frames each).** Photographs and text material on various examples of the type of transportation indicated by individual titles. The strips show modern and primitive types, interiors and exteriors, and uses. Planes, boats, and trains shown are those in use about 1920–1930. Individual titles follow with indications of additional material included.

**Transportation by Water (Rivers and Lakes).** Examples of both passenger and freight operations, including boats for special uses, such as fireboats and oil tankers.

**Transportation by Water (Ocean Passenger Ships).** Exterior and interior of S.S. "Majestic," a White Star Line ship; primitive and unusual ships are also shown.

**Transportation by Railroads in the United States (Passenger Service).** Definitions of various types of cars; views of interiors and exteriors; stations, signals, and switches.

**Transportation by Railroads in the United States (Freight Service).** Definitions and views of different kinds of cars; roundhouse; bridges along routes; scenic views along routes.

**Transportation by Water (Ocean Freight).** Views of different kinds of freight ships; loading and unloading activities.

**Transportation by Air.** Views of balloons and airplanes; uses.

**We Find Out About Freight (Our Friend the Freight Train) (NY, NH & H, si, 108 frames, teacher's guide, loan).** Study of freight-train operation. Opens with discussion at breakfast table concerning sources of foods and part of freight train in making them available. Father takes children to see basic mechanism of

freight operations. Includes warehouses, plantations, transport in refrigerated cars, through and local freights, activities in freight yard, information about train crew and their duties, and how cars are dropped along route. Suitable for use in intermediate and upper elementary grades. Sequence on freight yard well organized to show operations. Discussion of sources of products makes strip also a good supplement for geography classes.

**World's Two Largest Bridges** (Stillfilm, No. M-2, si, 37 frames). Various views of construction and completed structures of Golden Gate Bridge and San Francisco-Oakland Bay Bridge. Some information on size, exits, approaches. Suitable for use as supplementary material in elementary and junior high school classes.

### MISCELLANEOUS

**Asbestos, Mining and Use** (Stillfilm, si, 32 frames). General survey indicating origin, characteristics, grades of fiber, discovery, sources, and uses. Suitable for elementary grades. May interest general science classes as supplementary material.

**Automobile Manufacture, River Rouge Plant** (SVE, si, 34 frames, manual). Uncaptioned photographs showing various processes of automobile manufacture at the River Rouge Plant. Ends with chart showing historical development of the Ford motorcar. Needs information of type supplied in manual to be meaningful. Suitable for use as supplementary material in elementary grades.

**Cork Production** (Stillfilm, si, 32 frames). Common uses of cork products; cork-producing areas; tree from which obtained; removal methods, yields of trees, and years of productivity; processing and transport. Some good data concerning cork production. Suitable for use in elementary or junior high school geography or social studies classes. May interest nature study classes as supplementary material.

**Leather** (Stillfilm, 2 parts, 30 frames each). Part I shows processes involved in treatment of raw hides and skins to make leather. Part II shows processes in factory where chrome-tanned leather is made; uses of this leather indicated. Suitable for use in elementary geography or social studies.

**Lowell Thomas Meets the Premier** (Premier, sd, 20 min, loan). Commentator Lowell Thomas describes a visit to the Premier Vacuum Cleaner Factory, showing various processes in manufacture of the vacuum cleaners, stressing testing procedures, special materials, and processes employed. Includes a brief résumé of early cleaning methods. Vocabulary advanced, using many technical terms. Stresses value of this particular cleaner, with commentator indicating his desire to own one. May interest geography classes as supplementary material.

**Map Making** (SVE, si, 38 frames, manual). Uncaptioned photographs show a group of boys with instructor making a map; includes surveying methods, mak-



ing contour sketch, use of a sextant, professional surveyors, types of maps made, making of marine charts, and printing of maps. General information, no technical data. Needs information of type supplied by manual to be meaningful. May interest elementary geography classes as supplementary material.

**Motion Picture Industry** (Stillfilm, si, 32 frames). General survey showing various steps in motion-picture production, beginning with story conferences, casting, screen and voice tests. Show costuming, make-up, set design and construction, soundproof stage, mixing room, sound-recording truck, rehearsals, camera and shooting of scene, development of film, editing, cutting, and distribution of prints. Indicates major steps in movie production. Text material tends to be lengthy. Pictures of women's clothing in casting scenes outmoded. May interest elementary classes as supplementary material.

**Radio Broadcasting** (Stillfilm, si, 37 frames). General survey of how radio programs are broadcast from preparation of script to actual broadcast. Indicates "behind-the-scenes" controls and activities. Suitable for use in elementary grades.

**Rubber, Planting and Raising** (Stillfilm, si, 32 frames). Major processes in the raising of rubber from preparation of soil to shipment of crude rubber to factory. Indicates sources, grades, and types. Suitable for use in elementary grades. May interest nature study and general science classes as supplementary material.

**Soap Making** (Stillfilm, si, 32 frames). Opening sequence shows history of soapmaking from Biblical times to home processes used by our foremothers. Second sequence shows processes in a modern soap factory. Suitable for use in elementary social studies.

**Story of Fur** (SVE, si, 44 frames, manual). Development of fur industry beginning with demand of Europeans for beaver hats to modern methods of getting and marketing furs. Suitable for use in elementary grades.

**Story of Sponges** (SVE, si, 54 frames). Economic importance of sponges and areas where found. Operations at Tarpon Springs: gathering, cleaning, auction, processing, and grading. Sponge-farming methods. Types of sponges and their uses. Good information on sponge industry. Vocabulary somewhat advanced. Considerable text material. May be of interest as supplementary material in nature study classes also.

**Story of Tobacco** (Eye Gate, si, 82 frames). Process in raising, curing, sorting tobacco; the tobacco auctions; factory processes in making cigars and cigarettes. Suitable for use in elementary classes.

**Tire Manufacturing** (Stillfilm, 2 films, si, 30 frames each). Part I includes raw materials and their sources, processing of cotton for tire fabrics, inspection and testing of fabrics. Part II shows sources of crude rubber, processing of rubber,

making the tire casing, application of tread, curing, final inspection and testing. Some of the processes in detail. Suitable for elementary grades.

**World's Largest Aqueduct** (Stillfilm, si, 28 frames). The Metropolitan Aqueduct from Parker Dam to Los Angeles; data on construction, use, and size. Suitable for use as supplementary material in elementary geography, social studies, and elementary science classes.

See also the following series and individual titles for supplementary, illustrative, and related materials:

- Colonial Home Industries

- Conquest (railroads)

- Highways of History

- History of the American People Series

  - Mechanical and Industrial Progress

  - Industrial Expansion and Labor Unionization

- Middle Atlantic States Series

  - Manufactures

  - Natural Resources and Some Related Industries

- New England Series

  - Manufactures

  - Natural Resources and Some Related Industries

- United States Geography Series

  - New York (harbor and transportation)

  - Chicago (stockyards)

- The Middle States

- Panorama of the United States Series

- Clothing and Textiles

- European Background Series

  - Medieval Trades and Industries

- Transportation Series

- Trailer-Tractor Series

  - From an Idea to an Industry

- Cane Sugar

- Corn

- Cotton

- Oregon Flax

- Wheat

- Apples

- Citrus Fruits



Grapes and Raisins  
 Stone Fruits  
 Dairying  
 Cattle and Beef Industry  
 Sheep and Wool  
 History and Development of Agricultural Implements and Machines  
 Pilot Training Series  
     Men and Wings  
     Today's Wings  
 Pittsburgh  
 New York City  
 Regional Geography Series  
 Travel Is Fun  
 Communication—How Messages Are Carried

## PRINCIPLES OF GEOGRAPHY



From filmstrip "Work of Rivers." (*Society for Visual Education.*)

**Climate** (Eye Gate, si, 53 frames). Introduction includes definition of climate, types of changes in air condition, the atmospheric envelope. Torrid, temperate, and frigid zones—location, type of climate, reasons. Relations of sun's rays to various parts of earth and effect on temperature. Causes of seasons. Wind and its effect on climate. Review. Good subject matter for junior high school classes; however, the strip consists in the main of text frames and the visualization of ideas is not fully realized.

**Climates of the West Coast** (SVE, si, 51 frames, manual). Description of climates in various areas of the West Coast; effects of Pacific and coastal mountain ranges; type of vegetation in each area discussed. Although restricted in scope, material is clearly presented and may interest classes studying this area, or as a sample explanation of climate variations.

**The Earth—Latitude and Longitude** (Eye Gate, si, 61 frames). Explains latitude and longitude; uses of parallels and meridians. Discusses time belts, explaining need for such belts and locating those in the United States. Suitable treatment for high school classes. May be shown in two sections, treating separately of latitude and longitude and of time belts.

**Earthquakes and How They Are Recorded** (SVE, si, 33 frames, manual). Uncaptioned photographs and diagrams showing path of an earthquake, results of various quakes, how seismograph works, typical seismograph recordings. Manual explains meaning of graphs.

Requires information of type provided in manual, since strip contains neither captions nor text frames. Major portion deals with examples of seismograph recordings. Treatment and vocabulary of high school level.

**The Earth—Revolution and Consequences** (Eye Gate, 2 films, si). Part I (44 frames) defines rotation; explains cause of day and night, why the sun seems to move, and importance of rotation to life on earth. Revolution defined; diagrams of earth's position on orbit. Part II (53 frames) explains cause of seasons and their effect on life. Indicates source of earth's light and heat and importance of the sun. Treatment and vocabulary suitable for junior high school classes (or as review in senior high school). The two parts may be used independently if desired. Text frames contain some questions for class participation.

**Geology of Limestone Caves** (SVE, si, 40 frames, manual). Uncaptioned photographs show various limestone cave interiors indicating wall and floor formations, slabs, fossils, layers, stratum, rock surfaces, stalagmites, stalactites, unique shapes formed by erosion, underground pools and streams, geodes, and bubble formations. Manual provides information and identification. Requires information of type provided by the manual. Some very good photographs suitable for illustrative purposes. Treatment suitable for any classes studying limestone-cave formations.

**Glacial Age** (Eye Gate, si, 52 frames). Opens with explanation of ice age and effect on animal life and vegetation. Indicates how some animals adapt themselves to the climate; debris left after melting of ice (photographs of glacial terrain, glacial boulders, etc.). Deposits in revealed rock strata and how they are used to read the history of the earth. Various fossils, and indicates how they add to knowledge of earth. Some good photographic material and text frames are usually brief. Treatment suitable for upper elementary or junior high school classes. The material on the ice age itself is limited; strip presents more information concerning rock layers, fossils, and their meaning.

**Hemispheres—Continents—Oceans** (Eye Gate, si, 51 frames). Explanation and location of equator, Northern and Southern Hemispheres; North and South Poles, Eastern and Western Hemispheres, prime meridian, the continents, and the oceans. Suitable in treatment for upper elementary classes. Text contains some questions for class discussion and ends with a review.

**Icebergs and Glaciers** (SVE, si, 46 frames, manual). Uncaptioned photographs showing varied ice formations, glacier-eroded rock, glacial deposits, terminal moraines, glacial boulders, map of Greenland, ice floes, pack ice, icebergs, gla-



ciers terminating on land and in sea, glacier surfaces, measuring of glacier movement. Requires information of types supplied in manual. Some good illustrative material.

**Physical Geography Series** (Filmette, 8 films, si). Photographs of various examples of geological formations and phenomena indicated by the individual titles. The last filmstrip provides a summary showing the major phenomena and formations presented in the preceding strips. Captions in German, French, and English identify each formation and the location of the one shown in the photograph. Very good illustrative material suitable for any classes studying these subjects. Individual titles appear below.

**Structure of Mountains** (No. 63, 75 frames).

**Volcanic Formations** (No. 64, 93 frames).

**Decay Through Atmospheric Action** (No. 65, 93 frames).

**Wind and Mechanical Actions** (No. 66, 92 frames).

**Action of Ice in the Present and in the Ice Period** (No. 67, 90 frames).

**Action of Running Water** (No. 68, 80 frames).

**Action of the Sea** (No. 69, 60 frames).

**Synopsis of Physical Geography** (No. 70, 150 frames).

**Physical Geography Series** (SVE, 11 films, si, manuals). Uncaptioned photographs and relief models showing examples of formations and effects indicated by the individual titles. Each strip contains some good illustrative material, but requires information of the type provided in the manuals, since the strips contain neither captions nor text. The films contain a great deal of information for use in one class session (except for review purposes); therefore it is suggested that they be carefully previewed so that frames can be selected according to individual class needs. Individual titles are listed below.

**Active Glaciers** (32 frames).

**Continental Ice Sheet** (32 frames).

**Ground Water** (35 frames).

**Movements of the Earth's Crust** (38 frames).

**Weathering and Wind Deposits** (30 frames).

**Work of Rivers** (Part I, 55 frames).

**Work of Rivers** (Part II, 35 frames).

**Work of the Waves** (Part I, 30 frames).

**Work of the Waves** (Part II, 30 frames).

**Valley Glaciers** (36 frames).

**Volcanic Activity** (40 frames).

**Water Pictures** (SVE, si, 51 frames). A series of photographs showing "pictures" carved by water, presenting an interesting aspect of water-erosion effects. Each "water carving" is shown in close-up, preceded by a long shot of surround-

ings and stream or lake that produced the effect. Locations are indicated in most cases. May be of interest as supplementary material in physical geography, nature study, or general science in elementary grades.

**Zones and Climate** (Eye Gate, si, 78 frames). Location of zones with explanation of causes of climatic changes. Defines "river system" and "river basin," illustrating each. Cities of United States located at juncture of two rivers indicated. Causes of waterfalls; location of continental divide. First part concerning zones is clearly explained and may be shown separately if desired. Treatment is suitable for upper elementary or junior high school classes.

See also the following series and individual titles for supplementary, illustrative, or related materials.

Air Transportation Series

Meteorology and Navigation

Global Concepts and the Age of Flight

Map Making

Fluids Series

Atmospheric Pressure

Exploring the Atmosphere

Barometers and the Weather

Solar System

Cloud Formations and Air Masses

Elements of Weather and Atmospheric Circulation

Meteorological Instruments, Fronts and Forecasts

Rock and Its Uses

Weather

Aircraft Mechanics Series

Air Pilotage

Weather

Pilot Training Series

Air Ocean

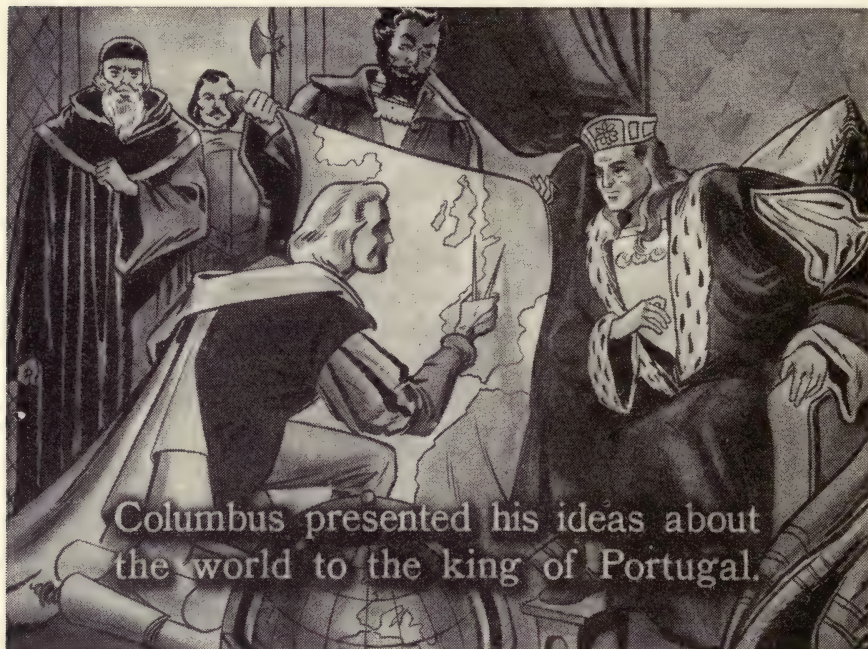
Air Masses

## AMERICAN HISTORY

The casual observer would probably expect history to be as prolific a field for filmstrips as its geography. This is not the case. Although there is some material that treats history in human terms and analyzes the civilizations of other eras in a manner interesting to students, the majority of strips (particularly in American



history) deal with political history. As is stated in the preface to "World History"<sup>1</sup> by Boak, Slosson, and Anderson, "How men have won a livelihood from nature is more important than how they have won battles from other men; what men have thought about the universe is of more enduring interest than what they



Columbus presented his ideas about the world to the king of Portugal.

From filmstrip "How Columbus Discovered America." (Popular Science Publishing Co.)

thought about the next election. But political history cannot be ignored. Apart from its own interest and importance it is a convenient framework for social, economic, and cultural development."

Purposes best served by currently available filmstrips in history are as follows:

1. To aid students in realization that history concerns real people and actual situations.
2. To provide specific examples of manner of life, equipment and working methods, transportation and communication, etc.
3. To demonstrate changes in manner of life and permit comparisons with modern civilization.
4. To aid in illustrating relationships between political history and the social and economic development.

<sup>1</sup> BOAK, ARTHUR E. A., PRESTON SLOSSON, and HOWARD R. ANDERSON, "World History," Houghton Mifflin Company, Boston, 1946.

**Abraham Lincoln Series** (SVE, si, manuals). Uncaptioned pictures of various activities, events, homes, and places of work related to the life of Abraham Lincoln. Maps showing location are included. The strip dealing with ancestry presents lineage charts. Photographs of monuments, memorials, and museum exhibits are shown in several of the strips.

The material may interest high school or elementary grade classes in American History as supplementary material. Information of the type supplied in the manuals is necessary to make the strips meaningful. Titles are listed below with indication of years covered.

**Ancestry of Abraham Lincoln** (27 frames).

**Lincoln in Kentucky and Illinois** (1809-1830) (37 frames).

**Lincoln in Illinois** (1830-1837) (43 frames).

**Lincoln in Springfield** (1837-1861) (48 frames).

**Lincoln in Washington** (1861-1865) (52 frames).

**Abraham Lincoln** (SVE, si, 66 frames). Reproductions of famous paintings, portraits, and early photographs showing important events of Lincoln's life. Brief captions identify each episode pictured. Suitable for use as supplementary material in upper elementary or high school history classes. Presents a general survey of Lincoln's life. Not to be confused with filmstrips listed in series above.

**Americans All** (Informative, si, 24 frames, manual). Reproductions of line drawings, each with a brief identifying caption, showing famous authors, musicians, scientists, and historical figures in chronological order. Includes among others Boone, Jefferson, Franklin, Washington, Longfellow, Horace Mann, Audubon, Mark Twain, Walter Reed, Edison, Burbank, Damrosch, Byrd, and Lindbergh. Each frame contains the portrait and two or three scenes of activities, achievements or, in the case of authors, scenes from books.

Frames are crowded with much material. Since the pictures are in chronological order, writers, musicians, etc., are within no other logical sequence. However, the material may be suitable for elementary grades social studies, reading, language, or history classes as supplementary material if individual frames are used as required by class needs. Manual includes information concerning contributions or achievements of each personality.

**Colonial Home Industries** (U.S. Nat'l Museum, No. 517, si, 60 frames). Briefly traces development of home textile industry, showing early home equipment and present-day handicrafts. Examples of patterns designed. Suitable for elementary history as supplementary material.

**Colonization and Development Series** (Stillfilm, 32 strips, si, about 30 frames each). Text and photographs alternate in all of these strips, with some strips containing considerably more text material than others. Numerous reproductions



of famous paintings are used, particularly with those strips dealing with early years. In general, the material is well organized for class use. This series is suitable for use in upper elementary or junior high school classes, and may be of interest as review material in senior high school. Individual titles are listed below, with brief descriptions where title is not self-explanatory.

**Early U. S. Indians** (No. H-48, 30 frames).

**Pilgrim Fathers** (Part I, No. H-49, 28 frames). Reasons for leaving England; sojourn in Holland; problems of journey to New World; beginnings of Plymouth settlement.

**Pilgrim Fathers** (Part II, No. H-50, 30 frames). Details and problems of early years of Plymouth settlement; spread of settlements; our heritage from the Pilgrims.

**Jamestown and Captain John Smith** (No. H-51, 30 frames).

**William Penn** (No. H-52, 30 frames).

**French in the Mississippi Valley** (No. H-53, 30 frames). From discovery by De Soto to transfer of Louisiana Territory to the United States.

**Dutch in New York** (No. H-54, 30 frames). From exploration of Hudson River to adjustment to English rule.

**Old New York (1675-1775)** (No. H-55, 30 frames). Various scenes of life in early New York.

**French and Indian War** (No. H-58, 30 frames).

**Life in the Colonies** (No. H-59, 30 frames). General survey of conditions and economic life in New England, with some scenes in Middle and Southern colonies.

**George Washington** (No. H-62, 28 frames).

**Concord and the Minutemen** (No. H-60, 30 frames).

**Declaration of Independence** (No. H-61, 30 frames). The Second Continental Congress and its purpose; continuation of war in meantime; details of preparation and acceptance of Declaration of Independence.

**Period Following the Revolution** (No. H-65, 30 frames). First census; lack of transportation and its effects; economic life; beginnings of industry; westward movements; Articles of Confederation; adoption of Constitution.

**Daniel Boone** (No. H-64, 30 frames).

**War of 1812** (No. H-66, 30 frames).

**Old Ironsides** (No. H-20, 28 frames). Details of the activities of the ship "Constitution."

**U.S.S. Constitution and War with Tripoli** (No. H-21, 30 frames).

**Rise of the West** (No. H-67, 30 frames). Reasons for development of the West; maps showing expansion; scenes of immigrant trains and life in Western areas; importance to nation.

**Westward Movement** (No. H-41, 31 frames). Scenes of Western areas and settlers' lives; maps of routes; development of railroads. Not so clearly presented as "Rise of the West," but additional material on this movement.

**Story of the California Missions** (No. H-15, 28 frames). Development and establishment of California missions; work of Serra Junípero; El Camino Real; local government; values of missions.

**Texas and the Mexican War** (No. H-68, 30 frames).

**Slave Life on a Plantation** (No. H-40, 34 frames). Mainly the best and most pleasant aspects of slave life.

**Struggle Against Slavery** (No. H-69, 30 frames). From status of free and slave states and Missouri Compromise to Civil War. Indicates slavery question as chief cause of the war, without suggesting any other contributing factors.

**Abraham Lincoln** (No. H-70, 30 frames).

**Civil War, 1861-1865** (Part I, No. H-71, 32 frames). Various scenes of the Civil War period, many reproductions of paintings and of Mathew Brady's photographs. Supplementary material only.

**Civil War, 1864-1865** (Part II, No. H-72, 30 frames). See "Civil War" (Part I) above. These two strips provide illustrative material without any attempt at interpretation.

**The New South** (No. H-73, 30 frames). Summary of development of the South from Civil War to present.

**War with Spain** (No. H-74, 32 frames).

**When Gold Is Discovered** (No. H-43, 28 frames). The Klondike Rush of 1908; effects on participants.

**World War Scenes** (No. H-79, 30 frames). Scenes of various events and people during First World War without any attempt to give a chronological history of the war. Illustrative supplementary material.

**Conquest** (Santa Fe, sd, 30 min, 183 frames, loan). The story of the Santa Fe Railroad and the men who built it, including information on the following: early methods of crossing the continent; Indian dangers during construction; first railways; maps of railways in 1940; planning, building, and developing the Santa Fe route; modern routes and equipment; importance of railroads to territory served. Concerned mainly with one railway line, but considerable material on the history of railroads in the United States. Useful as supplementary material in elementary grades and junior high school.

**Discovery and Exploration Series** (Stillfilm, si, 6 films). Text and photographs alternate in this series. Each strip presents the salient points in the explorations and discoveries conducted by the man or group named in the title and includes some other biographical material. The pictorial material includes also drawings, maps, and reproductions of famous paintings pertinent to the subject. The ma-



terial is well organized and suitable for use in upper elementary or junior high school classes. Individual titles follow with brief descriptions where title is not self-explanatory.

**Early Navigators** (No. H-35, 31 frames). Summarizes early explorations preceding voyages of Columbus, including Mediterranean trade, overland routes to Orient, search for direct sea passage, importance and work of Portuguese; map of known world at time of Columbus.

**Christopher Columbus** (No. H-36, 30 frames).

**Spanish Settlers in 1598** (No. H-25, 30 frames). Establishment and development of settlement of San Juan; information as to what the Spanish contributed to development of the New World, *i.e.*, horses and mules, cattle, churches, household furniture, and utensils.

**Sir Francis Drake** (No. H-46, 30 frames).

**Marquette and Joliet** (No. H-45, 30 frames).

**La Salle** (No. H-28, 30 frames).

**Discovery and Exploration of America Series** (Popular Science, 8 films, si, teacher's guide). Information for elementary grades on discovery and exploration through drawings, with brief superimposed captions and a few short text frames. The strips include many provisions for student participation and end with reviews or tests and suggestions for further study. A unique feature of this series is that causes and interrelationships of events during this period of history are pointed out. The treatment is such that the series can be utilized profitably from intermediate grades through junior high school, using them as a basis for review at the higher levels. Individual titles with brief descriptions follow:

**The Vikings** (49 frames). Opens with map showing where Norsemen lived, views of fiord coastline; the Norsemen's boldness in sailing the Atlantic; fierceness of the Vikings; fishing or raiding neighbors as means of making a living. Celebrations on return home used to introduce the Sagas. Saga of Eric the Red presented in detail: reasons for Vikings leaving their homes, settlement in Iceland, Eric the Red's settlement on Greenland, first sight of strange land to the west, Lief Ericson's explorations of Vinland, reasons why Vikings did not establish permanent settlement there.

**The Age of Discovery** (45 frames). Opens with sequence indicating why we today know much about our world. Outlines lack of knowledge and many superstitious beliefs about the world prior to discovery of America. Methods by which early Europeans learned about the Orient. Reasons for new surge of exploration. Activities of Portuguese. Early inventions aiding mariners and spread of knowledge.

**How Columbus Discovered America** (52 frames). Opens with sequence on Columbus's life as a boy in Genoa, his interest in the sea, his life as a sailor in service of Portugal and as a map maker. Development of idea that world is round and plans to reach Orient by sailing west. Story of his difficulties in getting support for such a voyage and eventual aid from rulers of Spain. Result of first voyage; outline of other voyages. Troubles with his colonies and return to Spain. Death as a poor and lonely man, never realizing the importance of his discovery.

**Spanish Discovery** (51 frames). How America got its name. Reasons for Spanish explorations. Contributions of following given briefly: Ponce de Leon, Balboa, Magellan, Cortez, Pizarro, De Soto, and Coronado.

**Cortez Conquers Mexico** (44 frames). Opens with indication of West Indies as Spanish base for further explorations. Story of Hernando Cortez's expedition to conquer Mexico from the landing at Vera Cruz to death of Montezuma and capture of Mexico City for Spain. Importance of mines indicated. Discovery of gold shown as influence on explorations of other nations.

**English Sea Dogs** (42 frames). Voyages and discoveries of John Cabot, Hawkins, Frobisher, Gilbert, Raleigh, Francis Drake. Founding of colonies; reasons for voyages; beginning of slave trade; rivalry between England and Spain and defeat of the Spanish Armada.

**Founders of New France** (48 frames). Voyages, discoveries, and contributions of Cartier, Champlain, Joliet and Marquette, La Salle. Establishment of permanent settlements; relations with Indians; development of fur trade; establishment of trading posts; map showing French occupied territory in 1700.

**History Review** (41 frames). Review of important points made in other strips of series. Indicates relationships and reasons for various voyages; importance of inventions; causes and effects of events. Presents a "Time Line of Discovery" chart for pupils to complete.

**George Washington—the Farmer** (Photo Lab, No. 277, si, 74 frames). Prepared in celebration of the two hundredth anniversary of birth of George Washington. Phases of his early life and his home surroundings as a country gentleman and farmer. Suitable for use as supplementary material in elementary grades or junior high school.

**George Washington—Father of Our Country** (SVE, si, 49 frames). Drawings and photographs showing various events in the life of George Washington. Includes reproductions of famous paintings. Good general outline of Washington's life. Suitable as supplementary material in upper elementary or junior high school classes.



**Highways of History** (Public Roads Admin., si, 35 frames, lecture notes). Reproductions of paintings and drawings showing the development and improvement of transportation in the United States from horses brought to the New World in 1539 to the San Francisco-Oakland Bay Bridge in 1939.

Good résumé of major developments in transportation. Each frame for extended discussion by instructor or by class members. Suitable for upper elementary, junior, or senior high school. May also be used as basis for further research on this phase of American history.

**Historic Rural Homes** (USDA, No. 334, si, 48 frames). Photographs of famous farm homes which are of interest because of their association with leaders in American history and American agriculture. Includes among others the Rolfe House, Myles Standish House, Wayside Inn, Hancock-Clark home, the Old Manse, Prospect, Lincoln's birthplace, Raven Hill, Stanford Ranch. Useful as supplementary material on all levels. May be used as basis for discussion of the owners of these homes and their contributions to history.

**Homemaking in Colonial Days** (USDA, No. 555, si, 64 frames). Early American home furniture and utensils; views of early interiors and of modern conveniences for contrast. Supplementary material for use on all levels.

**A History of the American People** (SVE, si, 15 strips). The 15 filmstrips of this series are listed and described below in chronological order. Some titles are listed without description as they are self-explanatory. This series is suitable for use in junior and senior high schools, particularly as introductory or review material.

**Discovery and Exploration** (No. 1, 65 frames).

**English Settlement and Colonial Conflicts** (No. 2, 72 frames). Life in early colonial settlements; contrasts between Northern and Southern settlements indicated; conflict with French and Spanish settlers; elimination of England's enemies in the New World. Ends with map of North America in 1763.

**The American Revolution** (No. 3, 66 frames). Bonds and frictions between England and colonies; events leading up to Revolution; beginnings of Revolution and résumé of major campaigns.

**Beginnings of the American Nation** (No. 4, 56 frames). Weaknesses of Articles of Confederation; unrest following Revolution; development of Ohio country; Constitutional Convention and events prior to Washington's inauguration; the country's finances, dissatisfactions in country areas and among poor.

**Establishment of the American Nation at Home and Abroad** (No. 5, 65 frames).

**Rise of the New West** (No. 6, 62 frames). Rapid overview of expansion after War of 1812; Missouri Compromise; problem of nullification; "pet" banks; de-

pression of 1837; social reforms of 1830's; development of public education. **Expansion to the Pacific** (No. 7, 57 frames). Includes development of lower Mississippi Valley; conflict in Texas, war with Mexico; in addition to development of settlements on west coast.

**Sectional Conflicts** (No. 8, 58 frames). Conflicts prior to opening of Civil War.

**The War for Southern Independence** (No. 9, 66 frames).

**The Country During Civil War Time and Reconstruction** (No. 10, 67 frames).

**Mechanical and Industrial Progress** (No. 11, 58 frames). Overview of changes during 1830's and following decades, including development of transportation, inventions and their effects, and beginnings of iron and steel industries.

**Industrial Expansion and Labor Unionization** (No. 12, 63 frames). Development of large industries, mergers, and trusts. Opposition to trusts. Effect of Sherman Act in regard to silver. Panic of 1893. Beginnings of union growth after 1869.

**Political and Social Reform** (No. 13, 71 frames). Survey of various reforms and their effects including conservation of natural resources, Reclamation Act of 1902, reforms in municipal politics, Civil Service Commission, immigration problems, women's suffrage, Eighteenth and Nineteenth Amendments, Underwood tariff bill, reform of large businesses, Federal Reserve Bank system, and Interstate Commerce Commission.

**America as a World Power** (No. 14, 70 frames). Acquisition of territorial possessions; America's part in Boxer Rebellion; establishment of Pan-American Union; beginnings of war in Europe in 1914.

**The United States in World War I** (No. 15, 68 frames).

**History of Pennsylvania** (SVE, made by University Museum, 51, 13 films, 50 to 60 frames each). While these filmstrips are concerned with the history of one state, they contain much information suitable for use as supplementary material in elementary and junior high school classes, particularly to show homes, equipment, and industries. Some of the strips (such as Nos. 2, 3, 4, 5, and 12) deal with events related directly to American history as a whole. These films may also be used as an incentive for individual research on the history of the state in which viewing students live. Titles are listed below in chronological order. No descriptions are provided as the titles are self-explanatory.

**Indians of Pennsylvania before and after Coming of the White Man** (No. 1).

**Discovery of Pennsylvania by the Dutch** (No. 2).



- Early Swedish Settlers in Pennsylvania (No. 3).
- Coming of William Penn and the Quakers (No. 4).
- Coming of the Pennsylvania Germans (No. 5).
- Westward Movement in Pennsylvania (No. 6).
- Pennsylvania's Part in the French and Indian Wars (No. 7).
- Early History of Pittsburgh (No. 8).
- Pennsylvania's Part in the Revolution (Part I, No. 9).
- Pennsylvania's Part in the Revolution (Part II, No. 10).
- Life in Pennsylvania after the Revolution (No. 11).
- The Story of Independence Hall (No. 12).
- Glimpses of Early Philadelphia (No. 13).

History of the States Series (SVE, si, 16 films, 35 to 50 frames each, manual). Photographs of famous buildings, portraits of famous men, homes of famous people, monuments, museum exhibits, battle sites, early homes, etc. Pictorial material is uncaptioned. Manuals provide the identification of pictures and additional historical information. May be of interest as supplementary material in elementary or junior high school classes. Titles are listed below. Descriptions are not provided since the strips contain collections of historic information concerning the state indicated.

- California, Historic
- Delaware, Historic
- Florida, Historic
- Georgia, Historic
- Illinois, Historic
- Louisiana, Historic
- Massachusetts, Historic
- New Mexico, Historic
- New York, Historic
- North Carolina, Historic
- Pennsylvania, Historic
- South Carolina, Historic
- Texas, Historic
- Utah, Historic
- Virginia, Historic
- Wyoming, Historic

Indian Life (Informative, si, 23 frames, manual). Reproductions of drawings showing villages, equipment, and activities of Indians of the Southeast, of the eastern woodlands, of the Southwest, and of the Northwest coast. Suitable for elementary history or social studies classes. Each frame is briefly captioned; manual

provides additional information. Some of the frames contain a great deal of material and will need greater elaboration by the instructor.

**Life in Colonial America** (Informative, si, 21 frames, manual). Reproductions of line drawings showing various aspects of colonial life, such as homes—interiors and furnishings—lighting equipment, industries, comparison of Northern, Southern, and Middle colony homes. Brief identifying captions. Manual provides additional historical information. Suitable for elementary history or social studies classes as illustrative material and basis for discussion.

**On the Trail of George Washington** (Photo Lab, No. 299, si, 75 frames). Prepared in celebration of two hundredth anniversary of birth of Washington. Presents scenes associated with the life of Washington from time of birth through youth, Mount Vernon days, the war, and early years of democracy. Supplementary material for elementary or junior high school classes.

**The Pilgrims as Real People** (SVE, si, 50 frames, manual). Uncaptioned reproductions of drawings and paintings showing various aspects of Pilgrims' life, stressing their trials and difficulties. Cannot be used without information of the type supplied in the manual. Does not give complete picture of Pilgrims' life, but additional material may be supplied by teacher or by members of class. Supplementary material for elementary grades.

**Pioneer Days** (Informative, si, 19 frames, manual). Reproductions of drawings showing various scenes of American pioneer life, such as transportation difficulties, fortified villages, life on Ohio River flatboat, problems in clearing land, work of women, and log cabins and sod houses. Brief identifying captions. Manual provides additional information. Suitable for elementary history classes or social studies.

**Presidents of the United States** (SVE, si, 65 frames). Photographs of each of the presidents from Washington to Franklin D. Roosevelt with brief quotations from each. Also shows birthplace or home of each. May be of interest as supplementary material in junior or senior high school.

**Rural Colonial and Early American Homes and Gardens** (USDA, No. 331, si, 61 frames). Exteriors and interiors of famous American homes including Stratford Hall, Sabine Hall, Royall Mansion, Mount Vernon, Hope, Montpelier, Monticello, Ashlawn, Elmwood, The Hermitage, and others. Similar to "Historic Rural Homes" and includes some of the same homes. Supplementary material on all levels. May be used as basis for discussion of the men who owned these homes.

**Story of Our Flag** (Visual Sciences, si, 43 frames). Strip consists of frames composed of text material with small spot illustrations showing early American flags, meaning of the colors, development of present flag, origin of term "Old Glory," the American's Creed, proper methods of display, pledge of allegiance. Many of



the frames are difficult to read as they carry a great deal of text. Material concerning proper display and treatment of flag well organized and suitable for elementary grades social studies.

**Theodore Roosevelt** (SVE, si, 40 frames, manual). Uncaptioned photographs and reproductions of drawings showing various scenes in the life of Theodore Roosevelt. Cannot be used without information of the type supplied by the manual. May be of interest as supplementary material in upper elementary or junior high school history. Does not give complete data on Roosevelt's life, but additional information can be supplied by teacher or members of class.

**The Vanishing Red Man Lives Again** (SVE, si, 42 frames, manual). Uncaptioned photographs of various Indian tribes and their activities. Pictorial material does not fully meet implications of the title.

See also the following titles for supplementary, illustrative, or related materials:  
Most Popular Girl in the World (Statue of Liberty)

Puerto Rico and Minor Possessions

Story of the Star Spangled Banner

Famous Trees in the United States

Forests of the United States

History and Development of Agricultural Implements and Machines

## WORLD HISTORY

**Ancient Egypt** (Stillfilm, Part I and II, si, 30 frames each). Both parts present views of various monuments of ancient Egypt. Part I includes photographs of ruins of the Ramesseum, the Pavilion of Ramses, the Temple of Edfu, the Hypostyle Hall at Karnak, the Temple of Light and Darkness, and the Temple of Augustus. Part II includes objects on museum display, columns and pillars, sphinxes, the Valley of the Kings, the Temple of Hathor, the Temple of Abu-Simbel, and the Colossi of Ramses. May be of interest as supplementary material in elementary or junior high school social studies and ancient history. Also may be useful as illustrative material in classes studying history of art.

**Clothing and Textiles** (Informative, si, 24 frames, manual). Reproductions of line drawings with brief identifying captions. Part I presents examples of the clothing of long ago, showing dress of both aristocracy or wealthy and of servants or poor. Part II shows the type of clothing worn in other lands. Last part presents a history of textiles showing weaving in the Stone Age, spinning in the Bronze Age, early spinning wheels, and inventions that developed modern spinning and weaving machinery.

Supplementary material for elementary social studies or history. First two parts may also interest dramatics classes studying costume. Manual provides additional information.

**The Development of Man** (SVE, prepared by the University Museum, Philadelphia, 6 films, si). Archaeological information in the form of long text frames;



**PLATE I — EGYPTIAN FARMING — 3000 B.C.**

From filmstrip "Early Civilization." (*Informative Classroom Picture Publishers, Inc.*)

some photographs of artifacts, fossils, reconstructions, etc., from museum collections and a few charts. The text material interprets the meaning and significance of the objects shown and indicates how this historical data was assembled. This series is suitable for senior high school or college classes in ancient history, archaeology, or advanced social science. The text material is often difficult to read because too much material is included on one frame; however, this difficulty may be overcome by using a reader if desired. The material presented is a good substitute for a museum visit for those classes unable to reach a museum providing exhibits of this nature. Individual titles are listed below with descriptions indicating the scope of information covered.

**Men of the Old Stone Age** (59 frames). Chart of geological eras; explanation of how age of remains is judged; photographs and information about



Pithecanthropus Erectus, Piltdown man, Heidelberg jaw, Neanderthal man, Cro-Magnon man. Examples of paleolithic art.

**Men of the New Stone Age** (57 frames). Advent of people of New Stone Age to Europe; type of culture brought; advances in agriculture, domestication of animals, pottery and implements; artifacts and their interpretation; the Lake Dwellers.

**Primitive Tools** (54 frames). Examples of primitive tools showing their development from early stone implements to Roman tools and implements.

**Development of Writing** (60 frames). Outline of the development of writing giving the three main stages—pictograph, ideograph, and alphabetic—with examples of each. The Phoenician alphabet and its spread. Chart of relationships of various alphabets.

**History of Clothing** (66 frames). Geographical factors affecting clothing worn. Examples of clothing of hunter cultures, of Lake Dwellers, of Egyptians, of Greece, and the Orient, spread of use of silk following the Crusades; influence of New World on use of cotton.

**History of Shelter** (62 frames). Illustrates various types of shelters: tents of nomads and of American Indians; immovable structures; cave homes; thatched huts; lake dwellings; wattle and daub homes; use of sun-dried brick; Egyptian and Greek private homes, Roman homes and tenements; influence of Rome and Greece on modern architecture.

**Early Civilization** (Informative, si, 23 frames, manual). Reproductions of line drawings showing various aspects of life in early civilizations including Egypt, Babylon, Palestine, Greece, and Rome. Frames contain much detail and are often difficult to see clearly in entirety. Only isolated instances of ancient life, but may be useful as supplementary material in elementary social studies or history.

**English History and History of Civilization** (Filmette, 4 films, si). Documentation of various historical events in English history through reproductions of portraits of personages and of paintings of events of each period indicated in the individual titles and photographs of surviving sculpture, manuscripts, books, buildings, and various artifacts. Brief identifying captions are provided in French, German, and English, all three languages appearing on one frame. These strips are suitable for senior high school or college classes in English history. Film No. 253 is applicable to study of ancient history also, and film No. 254 may be found useful in history of art classes. Individual titles are listed below.

**Early Iron Age of Britain and Roman Britain** (No. 253, 55 frames).

**Anglo-Saxon Art and Literature** (No. 254, 48 frames).

**The XIIIth-XVth Century** (No. 255, 60 frames).

**Reigns of Henry VIII and Queen Elizabeth** (No. 256, 55 frames).

**European Background Series** (Stillfilm, 12 films, si). Text frames and pictorial material alternate in the strips of this series. In general the text is fairly brief, pictorial frames well selected, and general organization good. Some of the strips are suitable for elementary grades, and others for junior or senior high school, as indicated below. Individual titles with brief descriptions follow.

**Ancient Roman Life** (No. H-42, 32 frames). General information on life in Rome, including luxury of ruling classes, life of servants and slaves, effect of taxes, treatment of conquered peoples, political scheming, punishments for political offenders, decline of Rome and its causes, triumphal marches, races and gladiators. Suitable for upper elementary or junior high school. May interest Latin classes as supplementary material.

**Ancient Rome** (No. G-59 and No. G-60, 2 films, 28 frames each). Random views of ruins and statuary of ancient Rome as it appears today; text frames identify views but provide no further information. Includes among others views of Tiber River, the Laocoön, sewers, Arch of Titus, Trajan column, various temples, the Sacred Way, the Forum, Coliseum, baths, and some homes. Suitable for elementary classes in history or history of art. Latin classes may find these strips of interest as supplementary material.

**The Crusades** (No. H-31 and No. H-32, 2 films, 32 frames each). Well-organized résumé of the Crusades, mainly reproductions of paintings and old woodcuts. Part I includes prevalence of pilgrimages to Holy Land; threat of capture of Byzantine Empire by the Turks; desire to rescue Holy Land Sepulcher; gathering of nobles; hardships and distress of Crusaders; battle of Nicea, siege of Antioch, return of armies to Europe with Godfrey in charge at Jerusalem. Part II outlines the seven principal Crusades and major events and indicates other expeditions such as the Children's Crusade. Excellent material on this subject for upper elementary or junior high school. May be of interest as review material in senior high school.

**Medieval War Implements** (No. H-39, 30 frames). General information on various types of military equipment in the Middle Ages including archers, scaling ladders, "pavis" shields, "gyns," boring instruments, battering rams, and various types of defensive measures. Suitable for upper elementary or junior high school classes.

**Castle Life** (No. H-78, 30 frames). General information on appearance, fortification, and interiors of castles and on minstrels, pages, squires, knights, tournaments, festivals, etc. Good material for junior high school classes. May be used as review or supplementary material in senior high school.

**Old London** (No. H-78, 32 frames). Historic places and buildings of London dating from 1419; original purpose, historic significance, and date of each.



Good supplementary material for upper elementary or junior high school classes. May interest classes in study of art and architecture also.

**Knights and Tournaments** (No. H-17, 30 frames). Pictures the training of a boy of seven until he achieves knighthood; shows jousts and tournaments, with some indication of purpose, participants, and activities. A great deal of text material. May be used in elementary history classes.

**Life of Napoleon** (No. H-56, 34 frames). Major events in the life of Napoleon, biographical data interpreted as to causes and historical significance. A number of reproductions of famous paintings. Good material for junior high school history classes; suitable for review in senior high school.

**Medieval Trades and Industries** (No. H-77, 28 frames). Drawings depicting various trades and workmen of the Middle Ages, such as armorer, carpenter, wheelwright, tailor, brewer, miller, furrier, papermaker, printer, book-binder, merchant, dentist, doctor. Apprentices, assistants, and master workmen indicated. Good material for junior or senior high school classes. Drawings resemble old woodcuts and may interest art classes.

**Famous Cathedrals of Europe** (No. H-57, 30 frames). Photographs of various famous cathedrals with information as to location, approximate date of building, and historical data centering around the structures. Includes Canterbury, Durham, Salisbury, Notre Dame, Rheims, Amiens, Cologne, Mainz, Strasbourg, Seville, Burgos, St. Peter's, Pisa, and St. Stephen's in Vienna. Good supplementary material for junior high school history. Also of interest in geography classes and in study of architecture.

**European History Series** (Filmette, 19 films, si). Documentation of the periods indicated by the individual titles through reproductions of portraits and famous paintings and photographs of existing sculpture, documents, manuscripts, maps, buildings, etc., showing the leaders and outstanding events. Material on mode of dress and manner of life included. Brief identifying captions in French, German, and English appear on each text frame. Suitable for use in senior high school or college classes in European history. Individual titles are listed below. Descriptions are not included since the titles are self-explanatory.

**Teutons and Romans** (No. 234, 110 frames).

**Migrations of Nations up to the Franks** (No. 235, 100 frames).

**Carolingian Period and Saxon Emperors (752-1125)** (No. 236, 97 frames).

**Monastic Life and Ecclesiastical Art** (No. 237, 105 frames).

**Hohenstaufens to the Habsburgs (1138-1519)** (No. 238, 109 frames).

**The Crusades** (No. 239, 60 frames).

**The German Town** (No. 240, 104 frames).

**German Handicraft, Productions of Applied Arts** (No. 241, 95 frames).  
**German Knighthood** (No. 242, 88 frames).

**Luther and the Reformation** (No. 243, 69 frames).

**Counter-Reformation and Thirty-Years' War** (No. 244, 93 frames).

**Development of Brandenburg-Prussian State** (No. 245, 65 frames).

**Frederick the Great and His Wars** (No. 246, 92 frames).

**The French Revolution** (No. 247, 129 frames).

**Napoleon I** (No. 248, 101 frames).

**Napoleon's Wars Against Prussia, Spain and Austria** (No. 249, 81 frames).

**Napoleon's Wars Against Russia—the Wars of Liberation (1813–15)**  
(No. 250, 82 frames).

**Efforts of Liberation of European Countries During the XIXth Century**  
No. 251, 97 frames).

**Bismarck and His Time** (No. 252, 95 frames).

**Greece Throughout the Ages** (Greek Gov. Office of Information; si, 59 frames, manual). A general overview of Greece and Greek history. Opens with map of three main divisions of modern Greece followed by geographical data and views, physical geography, and industries. Part II outlines Greek history beginning with Minos and invasion by the Dorians. Stresses spread and influence of Greek language and civilization. Ends with modern Greece as ally in both world wars and as "the cradle of democracy." A great deal of text material and at times the organization is not clear. However, the strip does show interrelationship of geography and history. Suitable for senior high school social studies and ancient history. May interest classes in history of art as supplementary material. May also be used as review in college classes or as discussion basis for adult groups.

**History of Switzerland** (Filmette, 10 films, si). Historical material on each period indicated through reproductions of famous paintings, monuments, inscriptions, artifacts, surviving buildings and reconstructions, sculpture, and manuscripts. Identifying captions, with dates and locations, appear in French, German, and English. Suitable for use in senior high school or college classes or with adult groups. The instructor may relate this documentary historical material to history as studied by his class, using these strips as illustrative material. Individual titles appear below. Descriptions are not included as the titles are self-explanatory.

**Development from Beginning Up to the Confederacy** (No. 257, 102 frames).

**Development to the Confederacy of Eight Districts** (No. 258, 103 frames).  
**XVth Century** (No. 259, 103 frames).

**XVIth Century** (No. 250, 103 frames).



**XVIIth Century** (No. 261, 123 frames).

**XVIIIth Century** (No. 262, 103 frames).

**Ruin of the Old Confederacy** (No. 263, 82 frames).

**XIXth Century, First Part** (No. 264, 100 frames).

**Period of Regeneration, Middle Part of XIXth Century** (No. 265, 103 frames).

**The Swiss Confederacy Up to 1874** (No. 266, 95 frames).

**Homes, Primitive** (Stillfilm, 2 films, No. S-33 and No. S-34, si, about 30 frames each). Part I mainly drawings giving historical data on homes including tree dwellers, cave homes, lake dwellers. Part II provides photographs of primitive home types in use today, as homes of Pueblos, tribes of Russian plains, Africans, Maori houses, etc. Text and pictures alternate. Suitable for use in elementary social studies.

**How Man Has Put Himself on Record** (Informative, si, 20 frames, manual). Reproductions of line drawings, each with brief identifying caption, picturing various types of man's records including cave drawings, knot writing of Incas, stone books of Egypt, cuneiform writing, story of the alphabet, Roman scrolls and wax tablets, parchment books of Middle Ages, early printing colonial hornbooks, and modern devices. Suitable for elementary social studies as illustrative material. Many of the frames contain much detail in drawing backgrounds reducing the legibility of the pictures.

**Knighthood in Medieval Times** (Informative, si, 22 frames, manual). Reproductions of line drawings, each with brief identifying caption, showing various phases of life during the Middle Ages, including castles, farming, villages, cathedrals, travel, warfare, mode of dress, trades, etc. Suitable for elementary grades social studies. Manual provides additional historical information. Drawings contain much detail.

**Life in Ancient Greece** (Informative, si, 16 frames, manual). Reproductions of line drawings, each with brief identifying caption, showing various phases of life in ancient Greece, including Athens, markets, mode of dress, temples and other buildings, household occupations, trades, recreation, Spartan life, theaters, etc. Suitable for elementary grades social studies. May interest classes studying history of architecture. Pictures contain either much detail or several scenes on one frame, reducing legibility.

**Life in Ancient Rome** (Informative, si, 16 frames, manual). Reproductions of line drawings, with brief identifying captions, show various aspects of life in Rome, including views of buildings, home interiors, household utensils, clothing, travel, and activities. Suitable for elementary grades social studies. Selected frames may interest classes studying history of architecture. Pictures contain either much detail or several scenes on one frame, reducing legibility.

**Peace Symbols** (SVE, si, 42 frames, manual). Photographs with brief identifying captions showing peace memorials and symbols. Includes among others Greek goddess of peace, William Penn Peace Treaty Elm; Statue of Liberty; Hague Peace Palace; Christ of the Andes; International Peace Bridge; Flemish peace shrine; Eternal Light Peace Monument; National Temple of Peace and Health. Date and location of each given. Interesting supplementary material for world history or international relations classes in junior or senior high school. Might be used as a general review by having class members indicate treaty or peace commemorated by each monument or symbol, with discussion of the fate of such agreements.

**Pre-historic Period** (Filmette, 2 films). Photographs of surviving artifacts of prehistoric times, and some reconstructions. Each item is identified by brief captions in German, French, and English. Suitable for use in high school or college classes in ancient history or archaeology.

**Pre-historic Period** (Stone Age) (No. 232, 87 frames). Neolithic caves, Rhodesian man, Neanderthal man; scenes of reindeer age, Old Stone Age and New Stone Age dwellings, tools, implements, etc.

**Pre-historic Period** (Bronze and Iron Age) (No. 233, 94 frames). Activities, utensils, weapons, tools, etc., of Bronze Age and of Iron Age.

**The Roman Forum** (SVE, si, 24 frames, manual). Uncaptioned photographs showing various scenes of the Roman Forum as it appears today. Not usable without information of the type presented in the manual, discussing history and uses of the Forum. Can be used as supplementary material in world history classes and may interest some Latin classes.

**Timekeepers Through the Ages** (Visual Sciences, si, 42 frames). Line drawings with text identification and explanation presenting a pictorial history of methods of keeping time, from prehistoric shadow pole to modern telechron electric clocks and astronomical clocks. Ends with standard time belts and types of clockfaces. Suitable for use as supplementary material in elementary social studies. First part well organized, presenting material in chronological order; last half requires additional explanation and organization by instructor for full clarity.

**Voyage and Discovery** (Informative, si, 24 frames, manual). Reproductions of line drawings, each with brief identifying caption, of scenes of voyages and discoveries from the Norsemen of the ninth century to Beebe and Roy Chapman Andrews. Suitable for use as supplementary or illustrative material in upper elementary or junior high school classes in history or social studies. Many of the drawings contain much detail, reducing legibility.

See also the Archaeology and Anthropology section and the following series or individual titles for supplementary, illustrative, and related materials:

**Monuments of Ancient Greece** (Greece Series)



Solomon's Temple  
Ascent of Man  
Human Progress  
History of Arts Series  
Museum Art Series  
Latin Series

## ECONOMICS, SOCIOLOGY, POLITICAL SCIENCE, GOVERNMENT, ETC.

In compiling the following material, it had been originally anticipated that the filmstrips would be listed under the individual subject matter headings that are now grouped together. Unfortunately, the paucity of available materials made such individual grouping impractical, even though this area is now receiving more attention from producers. Therefore the reader will need to scan the entire list in this subsection, rather than going to a single subject matter classification. This is not a satisfactory process because the titles included are often too general in treatment for specific teaching purposes, and the material is not always presented in the way most courses in these fields are organized.

Filmstrip subjects could be helpful in sociology, economics, political science, and similar courses. Topics that could be profitably treated include the following: charts of the interrelationship between component parts of a single government and between differing types of governmental structures; analysis and illustration of economic problems; presentation and interpretation of statistical material in interesting and easily understandable form; visualization of economic concepts, such as the law of diminishing returns or the relationship of wages and cost of living; diagrams of the structure of society; illustration of sociological principles, such as the sociological forces affecting the family; and similar phases.

Even though a few outstanding filmstrips are to be found in this section, the majority do not always achieve such specific objectives as those mentioned above. They can be used to illustrate some aspects that frequently occur in the study of these subjects. Some attempt to provide governmental charts and diagrams has been made in the more recent productions, particularly in treatments of the United Nations Charter. One specific economic problem, housing, and one specific sociological problem, racial prejudice, have received attention from filmstrip producers. Other strips approach illustration of relationship of economic and sociological problems, as in "Coal Miners" and "Harnessing The Rivers."

Because of the various criticisms noted above, the teacher in these fields may find that the available filmstrips have their greatest value in stimulation of discussion, rather than in direct teaching.

**American Counterpoint** (Film Publishers, si, 79 frames, guide). A discussion filmstrip for development of tolerance adapted from the book by Alexander Al-



From discussion filmstrip "Man—One Family." (*Film Publishers, Inc.*)

land. Shows examples of many Americans of different national origins, religions, and skin colors, indicating how they are different in appearance, speech, methods of play, study, and worship, and in what ways they are alike. Points out that all have the same heritage of freedom and that to deny any American the freedom to be different endangers the idea upon which American democracy was founded. Contributions to America in skills, talents, cultures, and ways of living. Photographs in filmstrip are uncaptioned except for indications of original nationalities; guide provides lecture notes, information, and suggested questions for discussion. Can be used for attitude development in junior and senior high schools. May also be of interest for discussion in adult groups. Well organized for discussion purposes.

**Caring for China's Children** (United Service to China, si, 96 frames, lecture notes, loan). Part I consists of scenes showing Chinese children, their homes in



cities, on farms, houseboats, and in villages; customs, clothing, games, schools, strength of family ties. Suffering of children during war. Part II shows aid provided through United China Relief—food, shelter, medicine, physical, and emotional rehabilitation, teaching of trades, cottage orphanage, schools, teaching adults child care. Importance of this work to Americans. While a plea for support of United China Relief, it is good material for social studies and sociology classes. Suitable for senior high school, college, and adult groups. Pictures uncaptioned; lecture provides information.

**City Planning** (SVE, si, 58 frames, manual). Photographs of city surroundings, transportation facilities, office buildings, churches, schools, libraries, government buildings, hotels, theaters, and other structures in various cities including New York, London, Paris, Detroit, Chicago, Rome, and others. Lecture notes relate these photographs to city-planning principle such as adaptation to geographic site, entrances to city, zoning, location of public utilities, etc. Designed for use in senior high school sociology classes. Requires information of type supplied in manual to be meaningful.

**City Within a City** (ACE, No. 22, si, 41 frames, lecture notes). Development of a housing project in New York City. Opens with photographs of the site, construction, and landscaping work. Major portion shows various aspects of the project, including arrangement of housing units, interior of typical apartment, conveniences provided. Suitable for senior high school and college sociology classes.

**Civilian Conservation Corps** (ACE, No. 32, si, 35 frames, lecture notes). Photographs show various activities and projects of the CCC; lecture notes provide information on administration, formation, values, and functions. Opens with sequence on need for aid for unemployed young men and boys. Although the CCC has been discontinued, this strip may be of interest to high school or college classes in social science, sociology, economic problems, or government as discussion material.

**Clearing the Slums** (ACE, No. 23, si, 43 frames, lecture notes). Opens with series of photographs showing typical slum conditions, both interior and exterior, pointing out hazards and problems of slum areas and their cost to the public. Part II shows several types of modern housing projects to replace slums, with views of exteriors, interiors, conveniences, and services. Indicates advantages of clearing slum areas. Suitable for use in senior high school and college sociology classes. May be used in conjunction with "City Within a City" described above.

**Coal Miners** (ACE, No. 33, si, 51 frames, lecture notes). Photographs showing coal-mining areas, coal miners, their homes and mode of life, work in mines, and coal-mining communities. Stresses importance of coal to modern life and industry.

Indicates poor housing conditions, lack of recreational facilities, dangers of work, etc. Provides example of improved mining community with better stores, homes, schools, hospitals, etc. Suitable for use in high school social science and economic problems. May be of interest as supplementary material in college sociology and labor problems classes.

**Economics for Everybody** (Film Publishers, si, 51 frames, guide). An overview of American economic life. First sequence is descriptive, indicating that modern exchange economy makes each person dependent for economic welfare upon all other parts of economic system. Second sequence, analytical, points out price as main force regulating and coordinating the economic system; price not an ideal regulator; elements inherent in economy interfere with smooth and prompt responsiveness to price changes. Third sequence concentrates on problem of how best to cure the economic ills that occur when price fails as a regulator; includes supply and demand, monopoly, effect of "bad times," governmental help, attempts at governmental leveling of economic index, maintaining standards of living, part played by labor and by management, importance of putting money to work.

This filmstrip is designed as the first of a series "America Looks Ahead," concerning the economic life and its problems. Other strips in the series, to be released later, are planned to take up specific problems. The filmstrip material consists of uncaptioned drawings (by John Fischetti); information, lecture notes, and suggested discussion questions appear in the guide. The filmstrip is well designed for discussion purposes in junior or senior high school, college, or in adult groups.

**Federal Government** (Young America, 5 filmstrips, si, about 40 frames each, teacher's guide). Although designed specifically as supplementary material for use in conjunction with the motion picture "Meet Your Federal Government," this series is organized so that the strips may be used independently. Factual information concerning the organization and functions of major elements of the Federal government are presented through photographs, drawings, and diagrams with brief captions and a few short text frames. A number of devices for student participation are included and each strip ends with a review or test. The material is well organized and visualization is good, particularly in the diagrammatic material. Treatment and subject matter are suitable for upper elementary or junior high school classes; although the vocabulary is too simple for senior high school, the series may be of interest at that level as review material. Individual titles with brief descriptions are listed below.

**Our Federal Government** (44 frames). Opens with the statement that the basis of our government is the principle that "the people shall govern themselves." Indicates how the Constitution provided for three branches to divide responsibility and provide checks. Includes a description of the three branches,



indicating main functions of each; steps by which a measure becomes a law; and examples illustrating the checks and balances system.

**Our Congress (Its Functions and Duties)** (39 frames). Explanation of the two-house organization: number of senators and representatives; how number is determined; qualifications; election; Congress as legislative body. Powers of Congress listed, illustrated, examples given. Expressed and implied powers explained. Special powers of each house. Emphasis on need for everyone to have interest in what Congress does.

**The Post Office Department** (45 frames). Development from 1775 given briefly. Classification of mail—what each major class is and types of material included in each. Special services, such as sale of stamps and envelopes, postal savings, insurance, registering, etc. The dead-letter office—function and reasons. Importance of proper addressing and of proper wrapping of packages.

**Department of the Interior** (38 frames). Illustrates some of the many activities of the department, stressing its main goal as promotion of general public welfare. Includes irrigation projects and electrification; soil conservation; conservation of natural resources; development of safety equipment and measures; conservation of wildlife; the National Parks; Indian reservations; geological and topographical surveys, etc.

**Department of Agriculture** (43 frames). Outlines the main division of the department and indicates the major functions of each. Includes the following: Agricultural Research Administration—Bureau of Entomology, Bureau of Animal Industry, etc.—Extension Division; Farm Credit Administration; Farm Security Administration; Forest Service; Rural Electrification; Soil Conservation Service. Stresses importance of services; aid to consumers as well as to the farmers.

**Foreign Trade: It's Good Business** (Film Publishers, si, 57 frames, guide, pamphlet, and other material). An argument for expansion of world trade. Opens with discussion of sources of various goods and foods. Typical arguments for and against protective tariff. Indicates what happened to foreign trade after the First World War and emphasizes need to expand trade pointing out effects of expanded trade. Drawings, cartoons, and some maps. Guide provides the information. Suitable for use in high school and college economics classes and as supplementary material in international relations, modern history, and social science classes. May also interest adult groups. Visual technique good.

**Forward All Together** (Film Publishers, si, 82 frames, teacher's guide). Discussion of racial intolerance. Opens with scenes of Americans of diverse stocks with some data on immigration of each group. Second sequence provides examples of intolerance and discrimination against Jews, Negroes, Mexicans, Chinese, etc. In-

dicates reasons for discrimination and intolerance as a road to Fascism. Last sequences suggest what can be done about intolerance and indicate beginnings made in education, arts, sports, industry, and professions. A good study of intolerance suitable for high school and college classes in social science. May interest adult groups or clubs also. Photographs and drawings; teacher's guide supplies information and lecture notes.

**Happily Ever After** (Film Publishers, si, 57 frames, teacher's guide). A discussion of the problems of marriage and the need for careful consideration and understanding of the problems, aimed particularly at the teen-age group. Opening sequence shows John and Mary on porch swing after John's proposal and their dreams of a perfect marriage—compatibility, companionship activities, dream house, ease of caring for baby, their five children and the success of each in life, boss's attitude in promoting John. Swing breaks, injuring Mary's wrist. Family doctor who bandages the wrist shows the couple how their dreams may be wrong: financial troubles, need for physical examinations, difficulties in caring for infants, possibilities of family arguments—effect on children and on work. Indicates Mary as chained to household tasks and John a desk slave. Suggests places where John and Mary may get information on various problems of marriage. Doctor himself advises need for proper sex information, for premarriage physical examinations, of waiting a year before having first child and of spacing later children.

Problems of marriage are presented in simple, clear treatment. Pictorial material (uncaptioned) is cartoon drawings by Roy Doty. The manual provides information, lecture notes, and suggested questions for discussion. Treatment suitable for high school, college, and adult discussion groups.

**Harnessing the Rivers** (ACE, No. 28, si, 39 frames, lecture notes). Uncaptioned photographs showing uses and dangers of uncontrolled rivers, construction of dams, and results of such projects. Lecture notes provide information. Emphasizes importance of rivers to any country. Includes description of Mississippi River, its uses, dangers, government control plans. Typical project shown from planning through construction to effects of finished dam on navigation, electric power, improvement of surrounding country, and improved living conditions. Concerns the TVA although this is not mentioned except in introduction in lecture notes. Suitable for use in upper elementary and junior high school social studies, civics, or geography classes. May be of interest also as supplementary material in senior high school economics.

**Housing** (SVE, si, 30 frames, manual). Part I contains views of slum areas, exterior and interior, showing health hazards and limited play space. Part II consists of photographs showing housing projects and the tenements each replaced.



Suitable for use in high school social science classes. Strip requires information of type supplied in manual to be meaningful, since pictorial material carries neither captions nor text. Problem of slum clearance not indicated as clearly as in "Clearing the Slums" described above.

**How to Live with the Atom** (Film Publishers, sd, about 16 min, si with lecture in script form, guide). A cartoon drawing discussion of the need for world control of atomic energy. Opens with sequence showing United States with atomic bomb; other nations fearful and suspicious; United States suspicious that others may develop the bomb. Discusses various approaches to an answer to the problem of the atomic bomb, showing results, difficulties, or impossibilities of each. Suggests world control with over-all authority to enforce it. Last sequence points out responsibilities of citizens to learn about latest developments, to discuss the problem, form opinions, and "get behind your decision." Ends with summary. Filmstrip leads up to a discussion session. Treatment good; strip moves rapidly and employs humor successfully. Suitable for use in senior high school and college government or sociology classes. Also of interest to adult groups.

**How to Conquer War** (Federalist, si, 190 frames, lecture notes). Urges elimination of armed conflict and stresses need for world peace organization. Provides brief history of conflict from time of cave men to modern warfare, pointing out general pattern of such conflict. Indicates weaknesses of League of Nations, of Articles of Confederation, and strength of United States Constitution. Gives various examples of democratic governments and urges formation of world agreement plan, indicating points required. Shows number of modern inventions that can be used either for progress or for war. Strip is very long, with much information for assimilation during one showing. Requires well-planned follow-up discussion to clarify points presented. Suitable for use in senior high school or college classes in international relations, social science, modern history, or government.

**The Inspection of Food Products** (Eye Gate, si, 66 frames). A résumé of food inspection laws and their operation and effect. Includes inspection of milk, eggs, meat, bakeries, canned foods, perishable foods, ice-cream and candy factories, of workers handling such products, and of foods in cold storage, in retail markets, and on stands. Suitable for use in upper elementary or junior high school social studies or civics classes. May also be of interest as supplementary material in home economics or hygiene classes.

**Is Your Home Fun?** (Pilgrim, 2d, 18 min, script of lecture and guide). A comparison of two homes, one which it is fun to live in and one which it is not fun to live in, with an analysis of what makes them that way. The Brown home, where the family is not very happy: overly neat, dictatorial attitude of father,

demand for constant quiet, boredom of children in the evenings, insistence on parent regulation of everything, even choice of clothing, attitude toward money. Gay home, where family is happy: neat, but a few things such as sewing or newspapers left about; permission to make noise, playing records, laughing cooperation in work, in play of entire family, planned family outings, freedom of children to some extent in clothing choice, evening fun. End sequence points out that home is an important part of the world and its spirit affects the spirit of the world. Gay spirit is based on playing and working together. Ends with question "Which one is yours like?" Music sets the mood for each home. Drawings and commentary crisp and humorous. Provides good discussional material for classes in the family, psychology, sociology, and for adult groups.

**Living Together in the United States Series** (Popular Science, 8 films, si, 40-55 frames each, teacher's guide). Designed for social studies classes in the intermediate classes (fourth, fifth, and sixth grades). Each strip presents one aspect of our mode of life, such as clothing, housing, communication, foods, etc. Each film opens with a situation in the life of two children, Billy and Betty, and provides a general overview of each unit, which can be expanded as desired by the instructor. Photographs, drawings, and maps. Captions and text are brief. The strips include reviews or summaries and opportunities for class participation or suggestions for follow-up activities. Individual titles follow with brief descriptions.

**Workers in Our Country.** Shows examples of various types of workers in the United States and the type of work each does, stressing the contribution to everyone's life.

**Story of Our Food: Part I: Where Our Food Comes From.** Major producing areas of several foods indicated on map with scene of field or orchard. Reasons for large food production of the United States. Types of foods imported and reasons why they are imported.

**Story of Our Food: Part II: From Farm to Table.** An outline of food production, indicating workers, processing, transportation, and selling. Reviews production of such foods as meat, bread, milk, vegetables.

**How We Are Clothed.** How cotton, woolen, and rayon clothes are made, from production of raw materials to part played by retail stores. Indicates workers concerned with each process.

**Our Homes and Our Communities.** A study of various types of homes; reasons why people live in different types of houses; various kinds of communities and reasons why people live in communities. Indicates needs for better housing, and workers concerned in providing homes from raw materials to completed structure.



**Communicating with Our Neighbors.** A survey of various methods of communication and the workers concerned with providing and operating each.

**Transportation in Our Country.** Methods of transportation, their uses, and workers involved.

**Play and Recreation in Our Country.** Survey of opportunities for play and recreation offered by school, home, community, and government. Reasons for play or recreation and discussion of selecting proper type.

**Man in the Cage** (United Productions, available from Brandon, sd, 16 min, color, discussion guide). A discussion of the need for a permanent Fair Employment Practices Commission. Opens with comparison of modern man and cave man as to shelter, comforts, conveniences, and medical care. Points out cave man's suspicion of others and lack of interdependence, as the "cave man attitude" or intolerance. Indicates needs for all kinds of people in development of United States and for laws to protect the varied groups. Examples of intolerance and methods by which hatreds grow. Learning that much can be accomplished by working together. The "caging" of intolerance during the war, and desire for intolerance to escape "cage" after war—results if this were permitted. Need to retain FEPC. Opening sequence confusing unless audience is prepared and knows what the strip is concerned with. The film may become dated by nature of subject matter, although if this occurs the reference to FEPC could be omitted for use in anti-intolerance study. Drawings and cartoons. Both cartoons and narration are well organized. Suitable for senior high school and college government, sociology, or social science classes. May also interest adult groups.

**Man—One Family** (Film Publishers, si, 57 frames, guide). Thesis that man is one family made up of many groups, all somewhat different, all equal and none superior. Fallacies of the Nazi "Aryan" theory pointed out and results of the myth indicated. Fallacies in stereotypes of nationalities; explanation of word "average" indicating how it cannot be applied as "an average American" or any other nationality. Basis for judging superiority: individuals such as Einstein, Marian Anderson, LaGuardia, Lin Yutang, Sikorsky, and others, as examples. How color, nationality, or religion cannot be considered in ability to learn to do jobs properly. Development of people from their education, homes, equal opportunities to purchase proper foods and to work for fair wages. Examples of discrimination in schools, in housing, and in play space. Stresses need for equal opportunity for all to contribute their best for the good of all. Based on the British Information Services motion picture of the same title, but incorporating additional material to bring emphasis on application of principle in the United States. Excellent basis for discussion purposes in high schools, colleges, or

adult groups. Uncaptioned photographs, diagrams, and drawings; guide provides speech notes, information, and suggested questions for discussion.

**Night Workers, U. S. A.** (Stillfilm, No. M-13, si, 35 frames). Examples of workers who carry on their duties at night with brief text explaining work done. Includes among others bank clerks, gas inspectors, theater-sign workers, street cleaners, telephone and telegraph operators, janitors, radio announcers. Good general survey of night workers with simple factual captions. Suitable for intermediate grades social studies.

**The People of France** (Film Publishers, si, 59 frames, guide). A study of the people of France and the land in which they live. Includes geographical data; contributions in literature, music, science, and art; effects of the Second World War on the land and the people; aid provided after the war; views of French delegates at UNO. Narration stresses need for assistance. Requires narration of type supplied in guide to be meaningful. Pictorial content does not always fully visualize subject matter given in manual. Suitable for use in senior high school or college classes in history, international relations, or social science. May also interest adult groups.

**Security for Today and Tomorrow** (Social Security, sd, 90 frames). Opens with brief history of Social Security Act and then illustrates benefits derived from this act. Suitable for use as supplementary material in high school government classes.

**Small Town** (ACE, No. 12, si, 56 frames, lecture notes). Life in a small town near the southern border of the United States in the cotton belt, showing homes, church, courthouse, library, school, main street, and activities on a typical Saturday night when farmers come in from surrounding area. Points out that small town is most "national" of settlements; indicates lack of crime, public utilities provided, lack of actual poverty or great wealth, friendliness. Suitable for use in junior or senior high school social science. Lecture notes may be adjusted to meet the requirements of the class.

**Suburban Family** (ACE, No. 13, si, 43 frames, lecture notes). A survey of life in suburban areas with indications as to why suburbs exist, advantages of suburban life, great use of electric appliances, type of people living in suburbs, work of mother, activities of children. Presented as the story of one day in the life of a typical family. Much emphasis on part played by electric appliances and the activities of the housewife. Suitable for use as supplementary material in junior high school or upper elementary social studies. Might be used with "Small Town" described above for a comparative study.

**Through China's Gateway** (Telefilm, 5 filmstrips, sd, si, about 15 min each; study guide and printed reproduction of entire narration). This series, written



and narrated by Pearl S. Buck, attempts to provide a background of information on China, the progress and changes, and present-day problems. The first strip is introductory and the last is a summary. The three intervening strips begin with general information concerning the pleasant aspects of the particular phase of Chinese life being discussed, followed by indications of difficulties and requirements, ending with suggestions for solutions of the problem. These suggested solutions present one point of view, but should stimulate thinking and discussion of the acceptability of the suggestions and the formulation of alternative solutions. The filmstrips consist of well-selected, uncaptioned photographs; the recorded (or printed) lecture provides information. The lecture is lengthy and in many cases requires a filmstrip frame to be held long on the screen. The study guide presents additional data and suggested questions and topics for discussion, pointing out the controversial points involved. Individual titles with descriptions follow:

**In the Chinese Manner** (No. 1). An introduction to China and the Chinese people. Brief résumé of geography, comparing southern and northern China. Indications of constant evidence of the old and the new side by side, both in environment and in customs. Change as shown by interest of the young people. Importance of the peasants to China; their adherence to ancient customs; their economic role. Various Chinese customs, such as wall newspapers, professional letter writer, teahouses. Illiteracy among peasants. Inherent honesty of people. Life of boat families. Descriptions of some important festivals. Importance of wandering theatrical groups in education. Important family days. Changes in status of Chinese women. Stresses that China will retain her ancient heritage but will adapt modern techniques and modes of living to her own life.

**China's Children** (No. 2). Opens with indications of China's age-old attitude of love and interest in children and desire for children in all families. Important days in infant's life described. Examples of schools: types of lessons, the abacus, games, different ideas of sportsmanship, method of writing, relation of music to all teaching. Stresses need for more schools of all types. Tradition as basis for reverence of all for learning. Reasons why many cannot attend school. Dangers to children of coming machine age; unprotected continuance of child labor. Need for more orphanages, hospitals, public-health services. Children's activities during the war and responsibilities assumed. Work in education of the illiterate, teaching first aid. Constant hunger of many; undesirability of charity-provided foods. Emphasis on children as important part in China's future.

**Food for China** (No. 3). First sequence discusses the typical Chinese diet, varieties of foods, use of vegetables and fish, table manners, differences be-

tween regions, abilities in art of cooking. Part of the peasants in supplying foods: maintenance of soil fertility, irrigation. Stresses that in spite of fertility of land much famine and hunger exists. Reasons for hunger: lack of money by many, high taxation, manipulation of markets, destruction of home industries, and difficulties of tenant farmers. Famine causes the following: floods, drought, insufficient irrigation, and mainly lack of transportation. Relief methods indicated. Cures tried, including cooperative farms, education in farming methods, lowering of taxes. Discussion suggests that cooperative farms may fail since Chinese farmer desires to own his own land. Suggests World Food Board as real solution—board to buy surplus foods and sell them to the hungry; stresses food as an inalienable right, not charity or politics.

**A Nation of Scholars** (No. 4). China's attitude toward learning and scholars; problems and difficulties of the students and their effect on change in China. Opens with résumé of age-old respect for learning; responsibilities assumed by the learned; educated as government officials; tradition of democracy in education. Goals of modern students, indicating differences, such as emphasis on technical and industrial knowledge and practical skills. Desires for the future: development of transportation and industry. Simplicity and hardship of students' life. Activities during war. Effect of inflation. Students' deep sense of responsibility—working on roads, teaching illiterates, conducting child-care classes. Need for more colleges. Difficulties of teachers—low salaries. Interest of students in international problems.

**China's Tomorrow** (No. 5). Opens with brief summary of China's history, particularly as to her contacts with other peoples; her highly developed culture; early contacts and trade with the United States; opium traffic and its difficulties; ceding of ports to foreign powers; attempts to unseat them; oppression by Manchu rulers. Sun Yat Sen's work for democracy, followed by that of Chiang Kai-shek and the work of the students. Communism: how it came to China through Russia's aid in the 1927 revolution; Chiang Kai-shek's work against communism and for freedom from foreign controls. American imperialism in China. Work of government to develop equality with other nations; to develop transportation and communications and industry. Japan's attack and methods of annexing China from time of First World War. The trade-union cooperatives. Adult education. Place of the women and children. Retention of old customs and addition of new modes of life. Problems of the farms. Inflation. Needs to abolish child labor and to provide metal tools, raw materials, transportation, and vehicles.

**Two Dollars** (Pilgrim, sd, about 18 min, color). A comparison of the way in which two different types of men regard money and the effect this has upon



their personalities, their friends, homes, and families. Opens with two one-dollar bills arriving at different homes. T. W. Brown refuses legitimate requests for money from family, refuses to make contributions to various causes, locks bill in box. Mr. Gay welcomes the bill, and plans to share with family; neighbor arrives and points out needs of church for money—long sequence showing work made possible by such contribution. Mr. Gay eventually left with a nickel. At bank each man deposits what he has left. Gay points out to Brown that either you own money or it owns you. Designed specifically for church use, and sequence on church needs for contributions may make its use in schools difficult. However, basic premise of “man with a nickel is worth more than man with a dollar” is well presented and may provide a good springboard for discussion in senior high school, college, or adult groups. Visualization by drawings is well done.

**The United Nations Charter—Its Structure and Function** (Film Publishers, si, 72 frames, manual, booklet of questions, pamphlet on United Nations and official documents issued during the First and Second World Wars supplied). Photographs, cartoons, and charts, with brief captions, present the basic principles and aims of the United Nations Charter. Main organs or agencies discussed as to purpose, activities, members, and types of events which will be its concern. Ends with review and statement of responsibility of all people to aid UN to work. Suitable for use in senior high school or college modern history or international relations classes. May also interest adult groups. Outlines main functions and organization of the UN clearly. Information of the type supplied in the manual is required to make the strip meaningful, since it contains no text.

**We Are All Brothers** (NY Univ., si, 60 frames). Based on “Races of Mankind” by Ruth Benedict and G. Weltfish, this all-drawing film presents a study of the race troubles question. Indicates similarities of physical structure of all races; explains what is really meant by word “race”; discusses fact that there is no “inventor race,” that language and customs are not determined by race, and that customs can change during a person’s lifetime. Shows how fear and ignorance bring intolerance and how to combat intolerance by learning the scientific facts about races. Stresses treating all people as human beings. Problem of race oversimplified, but can be amplified by instructor or by class discussion. Suitable for senior high school or college classes. May also interest adult groups.

**We, the Peoples** (Young America, 2 films, si). Although designed for use with producer’s motion picture of the same title, these two strips can be used independently and are available without the motion picture if desired. Unit I, “Needs and Purposes of the Charter,” discusses why world peace is necessary, why we joined the United Nations organization, and what our responsibilities are. Outlines the steps toward a world peace organization and stresses need for unity,

cooperation, trust, and international good will. Unit II, "Organization of the United Nations Charter," presents the framework of the organization and its major groups, indicating the functions and purposes of each. Points out our responsibilities in making the charter work, indicating why the League of Nations failed. Suitable for high school or college government or international relations classes, also modern history. The two strips may be used independently of each other if desired. Unit II is particularly clear in its organization and presentation.

**Women War Workers** (Stillfilm, No. M-11, si, 31 frames). A survey of the type of work done by women during the Second World War, particularly in airplane construction. Emphasis on women's ability to perform such work and their accuracy in jobs requiring precision. Interesting strip showing women's war work without too great emphasis on the "war work." Although this material may become dated rapidly, it may be of interest in upper elementary vocational guidance or social studies.

**X Marks the Spot** (Brandon, sd, 14 min). A plea for all citizens to register and vote, pointing out pertinent problems of government of the year immediately following the Second World War. Stresses the fact that "Congress has our future in its hands—but the future of Congress is in our hands." Strip tells story of one returnee's problems with employment, housing, etc., and of his learning to practice democracy by taking part in voting. Ending sequence urges citizens to know what or for whom they vote and to press Congress to combat large lobbies. Audience should be well prepared in advance prior to showing this strip, since organization is not clear or easy to follow. Banjo music in background at times distracts from clarity of the narration. Filmstrip may become outdated quickly by the type of legislative problems presented and by the returnee of the story; however, it may be of interest as a discussion springboard in high school government or civics classes.

See also the following series and individual titles for supplementary, illustrative, and related materials:

History of the American People Series

Beginnings of the American Nation

Industrial Expansion and Labor Unionization

Mechanical and Industrial Progress

Political and Social Reform

History of Pennsylvania Series

Story of Independence Hall

Development of Man Series



- Peace Symbols
- National Parks of the United States
- Indians of the Southwest
- United States Geography Series
  - New York (B) (Immigration)
- Rural Public Health
- Urban Clinic
- Patent Medicines: Old and New
- Frontiers of Grass
- Irrigation
- Soil Conservation
- Soil Erosion in the United States
- Pioneering a Permanent Country
- Forests of the United States
- Stop That Thief
- Testing the Drinking Driver
- Centralized School
- Parochial School
- One Teacher School
- Pilot Training Series
  - Aircraft Regulations
  - Traffic
  - Airway Aids
- Department Store
- New York City

## SOCIAL STUDIES—PRIMARY AND LOWER ELEMENTARY

**Children of Many Lands** (EB Films, 8 filmstrips, si, 65–70 frames each). Designed for use in conjunction with motion pictures of the same titles, but so organized that they may be used independently. Each strip presents various aspects of the life of children in other lands, arranged in short sequences dealing with such topics as the appearance of the country or the village in which the children live, their home activities, clothing, school, and games. Each sequence contains one or two questions for pupil participation and each strip ends with a review followed by suggestions for further study, reading, or things to make. To aid in making the vicarious experience as personal as possible, the information is usually organized as the daily activities of one specific family. The opening frame suggests that the viewing class may wish to ask questions as the pictures are shown, providing

motivation for expansion of subject matter presented. The series uses photographs with brief, simple superimposed captions. Individual titles are listed below with brief descriptions:

**Children of China** (63 frames). Appearance of village; work; activities; customs; schools; rickshas; sedan chairs; merchants and their shops; use of abacus;



From filmstrip "The Fireman," Community Helpers Series. (*Popular Science Publishing Co.*)

grinding grain; professional letter writer. Farm home life—working in garden, drawing water, cooking methods and foods, chopsticks, use of water buffalo and ancient tools.

**Children of Holland** (71 frames). Activities on farm—feeding chickens, getting milk ready for market, breakfast. Visit to uncle's mill, machinery in the mill. School—class, games. Market-day activities. Appearance of country, clothing worn.

**Children of Switzerland** (67 frames). Home activities of Swiss country people—clothing, work, effect of mountains on life, games, wood carvings, clocks and watches, tourists. The summer pasture—carrying hay, making cheese.

**Colonial Children** (53 frames). Colonial homes; tasks performed in the home by the children; work of parents; clothing worn; subjects studied and examples



of books; evening activities around fireplace ending with reading from Bible. Help between neighbors.

**Eskimo Children** (67 frames). Views of village and types of homes; cooking and sleeping arrangements; work—getting water, hunting driftwood, sewing, carving ivory ornaments, cleaning and drying fish. Trading at store; games and sports; hunting; listening to stories.

**French-Canadian Children** (70 frames). Location; winter appearance of land and climate; winter activities; use of sleighs and snowshoes. Daily activities of farm family: going to school in sleigh, the school and the French textbooks used, getting firewood, use of farm range for both cooking and heating. Handicrafts—hooking and braiding rugs, knitting. Taking ice from river, making maple sugar.

**Mexican Children** (70 frames). Appearance and dress of children; activities in village homes; school; fiesta. Use of oxen; children's work in caring for smaller children, watering flowers, feeding pigs and donkeys, taking lunch to father in the fields.

**Navajo Children** (67 frames). Where the Navajos live; how they dress; how they earn a living; children's pleasures; reasons for spring migrations. Summer and winter homes. Work such as planting squash and corn, repairing summer house, herding sheep, shearing, spinning, and weaving.

**Community Helpers** (Popular Science, 6 films, si, about 40 frames each, teacher's guide). This new group of primary instructional filmstrips may be found particularly helpful in development of attitudes and appreciations of workers and the work that each does and of realization of the dependence of people in communities upon various workers. The series, while suitable for reading, can be used profitably in social studies, language, and other primary activities. Child identification with the experiences presented is heightened by the use of stories concerning a small boy, Jerry, who introduces the subject of each strip. The pictorial frames have brief superimposed captions and the strips contain many pupil-participation devices. The first three titles are definitely concerned with helpers in large cities; this may present some difficulties in the use of these particular strips in smaller communities. Individual titles follow with brief descriptions.

**The Fireman** (40 frames). Opens with scenes of firemen at work, stressing rapidity of their attack on the fire. Presents questions: Should Jerry cross the street when he hears the sirens? Why should automobiles not park by hydrants? Sequence showing how the fire engines came to the fire so quickly: alarm turned in; how this reports the fire in the firehouse; signal board; sleeping quarters; use of the pole; firemen's training schools. Fire fighters on the water. Indicates need for firemen to be strong, brave, and healthy. Method of

introducing pedestrian safety measures and child cooperation particularly well done.

**The Policeman** (36 frames). Jerry visits Polly; pictures in her scrapbook about policemen show various activities, including helping people cross streets, controlling traffic, giving first aid, motorcycle and mounted police, watching stores at night, caring for lost children, helping firemen, radio patrol cars, catching dangerous men; indicates that policemen have to go to school and must be strong and know how to shoot straight. Ways in which children can help the police. Need to know how to call police if necessary. Stresses policeman as a friend.

**Communication—How Messages Are Carried** (48 frames). The story of Jerry's birthday party is used to present information on various methods in which messages are carried. Inviting friends to party, Jerry uses telephone and writes letters. Brief sequences show work of telephone linesman and helpfulness of operators; placement of stamp on letter, mailing it, postman's help. Jerry looks in newspaper to decide what to buy for party: scenes of reporters and linotypists. Day of the party: radio turned on, values of radios, how they help us; showing movies; telegram from aunt—views of telegraph operators. Ends with photo quiz.

**Shopping in Our Neighborhood** (39 frames). Anne, who lives in country, visits general merchandise store with mother: views of store interior, many kinds of things sold there. Cousin who lives in city, shops with mother: scenes of stores specializing in specific merchandise. Points out types of clerks, fact that country and city stores differ. Self-service stores and work of their clerks. Emphasis on clerks as helpers. Ends with photo quiz.

**Travel Is Fun** (Part I, 36 frames). Travel methods shown in story of Jerry and Jane going for a picnic; bus—helpfulness and carefulness of driver. Ferry—closing of gates, use by people and for cars, the captain and the engineer; other boats seen from ferry—tug, steamship, excursion boat. Taxi.

**Travel Is Fun** (Part II, 42 frames). Journey to New York by Jerry and his family shows the following transportation: air travel—the airport, plane interior, pilot, copilot, stewardess, workers who fuel and check plane. In city: bus, trolley, subway. Train trip home—station, engineer, fireman, conductor, diner, men who prepare and serve meals. Both Part I and II stress what people do to help us travel.

**The Home Series** (Long, 5 films, si). Depicts the activities of a typical American family with three children, telling about the work and play of all members. Major emphasis is on the need for cooperation within the family as a basis for democratic living. Questions for class participation are included. Vocabulary of the



brief captions suitable for lower elementary grades. Individual titles with brief descriptions follow.

**The Day Begins** (No. I, 26 frames). Morning activities of the family: getting up when called; cleanliness; morning chores of all members; ends with going to school.

**Father Works for the Family** (No. II, 33 frames). Methods by which fathers travel to work; things that fathers buy for the family; types of work that fathers do—including such occupations as farming, mining, driving trucks, work as policemen, doctors, and in offices.

**Mother Cares for the Family** (No. III, 24 frames). Activities of a mother's day taking care of family needs, including housework, marketing, cooking, gardening, playing games in the evening, working on budget, laundry. Also shows her work as nurse's aid in clinic and her part in PTA.

**The Children Have a Busy Day** (No. IV, 23 frames). School activities of the two older children and also their play, errands run, evening chores, dinner, evening activities, and bedtime.

**Holiday** (No. V, 23 frames). Activities of entire family on a holiday. Includes cooperative work of all members in preparing for the picnic and packing the car, locating the picnic spot, activities during picnic finishing with cleaning up and putting out fire carefully.

**Home and Community Life** (Our City) (Informative, si, 20 frames, manual). Reproductions of line drawings showing various aspects of community life, such as firemen, telephone workers, newspapers, markets, clothing suppliers, trains, trucks and buses, playgrounds, libraries, schools, churches, homes, water supply, and power lines. Indicates services of each to those living in the community. Considerable material for discussion of community life. However, each frame contains detailed pictures, which may be confusing at the lowest age levels, and a few frames present more than one drawing. Brief captions identify each drawing, the manual provides additional information.

**Jimmy Rabbit Educational Series** (Coast Visual Education, 3 films, si, color). Cartoon drawings of Jimmy Rabbit illustrate rules for safety in play and factors in democratic living and in healthful living in these three filmstrips. Each pictorial frame shows Jimmy Rabbit doing the proper thing indicated by the rule superimposed on that frame. These films are of the "slide lecture" type, with little definiteness of organization or continuity; therefore, each frame can be used separately if desired, or in any sequence. The rules of principles are stated only; there is no attempt at interpretation or motivation other than the mere statement that "children like to" do certain proper things. Several frames indicate that fol-

lowing the rules is "fun," but this is not convincingly presented. Individual titles following with indication of the type of material contained in each. Vocabulary and subject matter suitable for primary or lower elementary grades.

**Safety at Play** (No. I, 19 frames). Includes helping younger children cross streets, keeping shoelaces tied, proper carrying of pointed objects, waiting turns, and safe play on teeter totter, on giant stride, in playing tag, playing baseball, flying kites, swimming.

**Democratic Living** (No. II, 18 frames). Includes helping at home, helping smaller children, being polite, waiting turns, working quietly, helping neighbors, putting things where they belong, giving lost articles to teacher, acting quickly and willingly, sharing toys, finishing jobs started, taking care of playthings and books, going home from school promptly, listening carefully and following directions. Suggestions preceded by phrase "we like to . . ." in most cases, as "we like to help our friends."

**Wholesome Living** (No. III, 18 frames). Includes health rules, such as clean clothing, looking neat, eating properly, drinking milk, use of rainwear, correct sitting posture, playing in fresh air, use of good light for reading, cleanliness, and fresh air when sleeping.

**Sing a Song of Friendship** (Popular Science, 5 filmstrips, si, color, 4 records, teacher's guide). This series is based on Irving Caesar's "Sing a Song of Friendship" and designed for classes in intercultural relations and democracy from first to sixth grades. The filmstrips illustrate the songs in photographs and drawings, using the lyrics as captions. The songs concern topics including good citizenship, tolerance, the United Nations, democracy, world peace, and the liberties enjoyed in our own country. The songs may be used as motivation and a basis for discussion in the development of attitudes. While the filmstrips are available separately, it will probably be found that they are not so helpful as they might be with the recordings unless the songs are already being used. Individual parts are listed below, with titles of songs included in each part indicated. Descriptions are provided where titles are not self-explanatory.

**Part I** (47 frames). "How to Spell Friendship"—letters of word as symbols for freedom, rights, neighbor, democracy, etc. "It Is Always Music to His Ears"—prayer acceptable no matter where or on what day you pray. "I Know a Friendly City." "Let's Make the World of Tomorrow Today."

**Part II** (54 frames). "Thomas Jefferski"—tolerance, no matter what a person's name is he can still be the best of friends. "There's Something about America"—opportunities, friendliness, freedom. "We Have a Law"—Bill of Rights as law to be proud of; freedom of all to write to public officials. "Election Day"—importance of voting.



**Part III** (48 frames). "A Man and a Maid"—voting as you please, working for equal wages, planning together, and cooperation in a free country. "Tommy Tax"—uses and importance of taxes. "We Address Him as Mr. President." "Our Football Team"—members of team all Americans even though their parents may have come from many different lands. "Hallelujah, Bless the Peace."

**Part IV** (48 frames). "Child of All Nations"—the United States as this child. Need for aid of the United States to the oppressed, White House as lighthouse for the world, brother to all nations. "Fifty Friendly Nations"—purpose and achievement of San Francisco Conference, importance of the United Nations Charter and peace.

**Part V** (43 frames). "Song of the Good Neighbor"—friendship and cooperation with Latin-American countries. "We'll Soon Be One World"—United Nations theme, need for friendship and cooperation in world made small by improved transportation and communication. "United Nations," "This Is Our Last Chance for Peace."

See also the Reading and Safety sections for additional material.

# Sports

Although some teachers may question the necessity for a section on sports in this book, it is included in order to give as complete a picture as possible of all subject matter treated in filmstrips that may be used in schools or colleges. This area has not received a great deal of attention from filmstrip producers although one recently produced series is described below and another series is in production. Whether or not funds from a coordinated visual aids budget should be applied to sports material is a question which can only be decided locally. There is considerable evidence to support the theory that filmstrips on most sports are not important enough to justify the expenditure of teaching materials funds. If the physical education instructor feels that filmstrips are needed more than additional athletic equipment, the following descriptions may prove of interest. In most sports motion pictures are much more desirable than filmstrips since the all-essential component of timing can be shown effectively only in motion.

**Football Series** (SVE, 3 filmstrips, si, about 40 frames each, manuals). The fundamentals of play, responsibilities of line and backfield, and position during typical plays. The strips are uncaptioned, consisting of photographs and diagrams. The manuals supply identification and information. The series may be of interest particularly with beginning teams. Titles with brief description of contents follow:

**Football—General Fundamentals** (39 frames). Includes general fundamentals such as setting-up exercises, passing, tackles, correct holding of ball in catching and running, drop kick.

**Football—Fundamentals of Line Play** (42 frames). Fundamentals such as position, posture, movement. Diagrams of players' positions during typical plays.

**Football—Fundamentals of Backfield Play** (40 frames). Fundamentals such as position, posture, movement, interception of players, tackles. Diagrams of players' positions during typical plays.

**Football—The "T" Formation** (Curriculum, 14 filmstrips, si, color, coach's guide). Designed for use in conjunction with the motion picture "Howie Odell's Basic Plays of the T-Formation," but can be used independently if desired. Except for the introductory filmstrip and the one on pass protection, each film in the series presents diagrams and photographs of particular basic T-formation plays against specific defenses. The general treatment in these consists of a diagram of the particular play against one type of defense followed by photo-



graphs of the play in which colored arrows indicate the movements of the players. All the plays are shown to one side only and the producer suggests that play to the other side may be shown by merely reversing the filmstrip in the projector. Individual titles follow with brief descriptions.

**Numbering of Holes—Lineup—Man in motion** (20 frames). Diagram showing hole numbering for right plays against five-man line. Examples of Right 166 play. Diagram for left plays—Left 166 shown. Diagrams of hole numbering against six-man line—right and left with example of each. Photographs of team, gaining space in backfield, call for signals, motion of left halfback as signals are called, defense 5-3-2-1.

**Play No. 32** (31 frames). Quarterback sneak against 5-3-2-1, 6-2-2-1, and 7-2-2 defense.

**Play No. 62** (31 frames). Fake end run with halfback against 5-3-2-1 6-2-2-1, and 7-2-2 defense.

**Play No. 44** (39 frames). Delayed inside tackle play against 5-3-2-1, 6-2-2-1, and 7-2-2 defense.

Also cross blocking against 6-2-2-1 defense.

**Play No. 56** (24 frames). Off tackle against 5-3-2-1, 6-2-2-1, and 7-2-2 defense.

**Play No. 58** (30 frames). Quick end run against 5-3-2-1, 6-2-2-1, and 7-2-2 defense.

**Play No. 344** (38 frames). Quick opener inside tackle against 5-3-2-1, 6-2-2-1, and 7-2-2 defense. Also quick opener cross blocking for 6-2-2-1 defense.

**Play No. 336** (32 frames). Fake buck—quarterback keeps against 5-3-2-1, 6-2-2-1, and 7-2-2 defense.

**Play No. 358** (30 frames). Fake buck end run against 5-3-2-1, 6-2-2-1, and 7-2-2 defense.

**Play No. 154** (33 frames). Counter inside tackle against 5-3-2-1, 6-2-2-1, and 7-2-2 defense.

**Play No. 166** (20 frames). Counter off tackle against 5-3-2-1 and 6-2-2-1 defense.

**Play No. 158** (30 frames). Counter end run against 5-3-2-1, 6-2-2-1, and 7-2-2 defense.

**Play No. 258** (36 frames). Power end run against 5-3-2-1, 6-2-2-1, and 7-2-2 defense.

**Pass Protection** (32 frames). Diagrams of following, each followed by photographs of team in action with movements indicated by colored lines and arrows: pass protection against five-man line, guards free blockers; against six-man line, center free blocker; against seven-man line, cup protection.

**Wrestling** (SVE, 2 filmstrips, si, 51 frames each, manuals). Photographs of the various holds and escape methods, each identified briefly by superimposed captions. The manuals supply additional information. The films may be of interest to demonstrate typical holds, etc., for large groups that would have difficulty in seeing clearly an actual demonstration. Titles with brief description of contents follow:

**Wrestling—for High School and College (Elementary).** Exercises for strengthening various muscle needed in wrestling; methods of jockeying for opening; various holds and appropriate breaks or escapes, including ankle hold, leg hold, arm lock, head chancery, cross-buttock hold, the "go-behind," leg grapevine, half nelson, hammer lock, waist hold, leg ride, three-quarters nelson.

**Wrestling—for High School and College (Advanced).** Starting positions; various holds and escapes, take downs and falls. Includes head scissors, head-lock, short-arm scissors, reverse double bar, body holds, split scissors, figure-four scissors, crucifix hold, arm twist, armlock and roll, double wristlock, cradle, toelock.



# Vocational Guidance

There are perhaps two major criticisms of the materials available for vocational guidance: (1) Few of the filmstrips provide enough illustration of the actual type of work done in each field. In order to make a selection of an occupation for more detailed study, the student should be given an opportunity to learn details of the everyday tasks performed. The filmstrip could supply such information although it frequently does not. (2) Much of the available material was produced some time ago and thus does not provide information on present-day qualifications and requirements, extent of opportunity, and newer types of work. Of course, this time lag can be rectified by the instructor or by student research, but such an introduction to any occupational field is unfortunate.

Also, the majority of filmstrips on this subject deal with the occupations themselves and little has been produced to assist the student in evaluating his own aptitudes or in indicating methods of selecting a vocation and the points to be considered in such selection.

As in most subject matter areas, there is opportunity for considerable new production in this field, especially for groups above high school age. The need for vocational guidance is becoming increasingly recognized and visual material could aid the instructor, particularly in providing illustrative and informative data on a wide selection of occupations.

Summarizing the uses of the filmstrip in vocational guidance, the following appear to be of most assistance to the instructor:

1. To acquaint students briefly and rapidly with many occupation types, and to permit greater scope for their selection of those they may wish to investigate more fully.
2. To provide an easy method for comparison of various occupational areas.
3. To help students understand the type of work involved in the occupations considered.

**Air Transportation, Jobs and You** (United Air Lines, available from SVE, si, 56 frames). A general survey of the type of jobs in the air-transportation industry. Opens with number of employees in domestic air transport in 1935-1943 and estimate for 1948-1949 and with statement of what United Airlines offers employees and what it expects from employees. Jobs shown include stenographers, accountants, mimeograph operators, and other clerical positions; engineers, publicity men, laboratory technicians, draftsmen, cooks, pilots, stew-

ardess, director of flight operations. Also shows the following jobs in flight operations: directors, radio operators and testers, wire operators, meteorologists, flight planning, line and shop mechanics. The following jobs in traffic: district manager, passenger agent, station attendant, station manager, reservationists, counter sales, ground-service employees. A fairly good overview of existing jobs, but little information as to preparation or education required, pay scales, and actual work done in each job.

**Careers Series** (SVE, 45 films, si, about 46 frames each). A general overview of the types of jobs or positions available in each field of work, with some indication of preparation, education, and other requirements and desirable personal qualifications. Much text and the pictures illustrate general aspects only. In some areas new types of positions have been created since this series was made; however, this information could be added by the instructor. The filmstrips are suitable for junior or senior high school vocational guidance groups, particularly as a basis for further discussion. Individual titles are listed below. No descriptions are provided since the titles are self-explanatory.

**Agriculture as a Career**

**Apprenticeships in Industry**

**Art as a Career**

**Army and Navy, Careers in**

**Automobile Industry, Careers in**

**Aviation as a Career—Manufacturing**

**Aviation as a Career—Transportation**

**Aviation in Government Service**

**Banking as a Career**

**Beauty Culture as a Career**

**Building Trades, Careers in**

**Ceramic Engineering as a Career**

**Chemistry and Chemical Engineering as a Career**

**Civil Engineering as a Career**

**Clerical Work as a Career**

**Coast Guard as a Career**

**Domestic Service as a Career**

**Electrical Engineering as a Career**

**Forestry as a Career**

**Home Economics as a Career**

**Hotel Administration as a Career**

**Hotel Occupations as a Career**

**How to Apply For, Win, and Advance on the Job**



Journalism and Newspaper Operation as a Career  
Librarianship as a Career  
Mechanical Engineering as a Career  
Medicine, Dentistry, and Pharmacy, Careers in  
Metal Trades as a Career  
Mining and Metallurgical Engineering as a Career  
Music as a Career  
Nursing as a Career  
Occupational Therapy and Laboratory Technique as a Career  
Police Administration, Careers in  
Public Service, Careers in  
Radio, Careers in  
Retail Merchandising as a Career  
Social Work as a Career  
Teaching as a Career  
Telegraph and Telephone Operators  
Trade Training in the U. S. Army and Navy  
Veterinary Medicine as a Career  
Vocational Guidance for Negroes, the Need for (Part I)  
Vocational Guidance for Negroes, the Need for (Part II)  
Your Job—Are You Preparing for It?

**Department Store** (ACE, No. 38, si, 47 frames, lecture notes). Opens with brief comparison of early dry goods stores and large department stores of today; indicates change from men to women sales personnel. Indicates types of positions held by men in department stores, from administrative positions to jobs such as night watchmen and worker in shipment departments. Work of woman employment manager and her assistants. One employee followed from the time she applies for a job to her appointment as a buyer, showing various kinds of jobs, the in-service training program, the executive training school, methods of advancement. Uncaptioned photographs; the lecture notes supply information. The strip presents a good survey of one aspect of merchandising as a career for women while showing considerable detail concerning management and organization of department stores. May also interest classes in social studies.

**The Mason** (Filmette, 3 films, si, guides). A general survey of the types of work done by masons, including examples and diagrams of details of masonry work. There are no captions or text frames; information is supplied in the manuals. This series may also interest shop classes or vocational schools studying masonry. Individual titles are listed below.

**Fundamental Principles and Masonry** (No. 60, 46 frames).

**Details and Constructions** (No. 61, 58 frames).

**Practical Masonry** (No. 62, 84 frames).

**The Mechanician** (Filmette, No. 51, si, 118 frames, guide). Photographs showing various details of a machinist's work including operations in filing, drilling, turning, planing, shaping, stamping, etc. A general overview of actual work done. Photographs are not captioned, and therefore information of type supplied in guide is required. Strip provides information on actual work performed in such jobs. Suitable for vocational guidance groups and may interest beginning machine-shop classes to introduce various phases of work.

**Registered Nurse** (ACE, No. 16, si, 52 frames, lecture notes). Survey of schooling, training, requirements for and duties of a registered nurse. Told as a story of one girl who decides she wishes to become a registered nurse. Includes activities of the probationer and of nurses in training. Indicates need for hard study and some of the less pleasant aspects of nursing. Stresses the dignity and respected position of nurses. A good discussion of nursing as a career. Presents both good and bad characteristics of such work, permitting the student to evaluate it more fairly as a possible choice.

**The Service Man—a 4-in-one Guy** (Westinghouse, No. 43E-5115, sd, 25 min, maintenance guides, loan). Discusses the electric-appliance service man as expert mechanic, businessman, doctor, and actor, illustrating each role in typical service call, beginning with the telephone call from housewife. Proper methods of answering telephone, routing, preparation of service repair kit and stock, manners and appearance, laying out tools and proceeding with work—stressing need for cleanliness, safe topics for talking with housewife, presenting bill properly, cleaning up after work is completed, checking other appliances, maintaining effect of competence and efficiency. Ends with importance of serviceman's work; service as a good and growing business. Type of work involved in electrical service clearly, indicating several aspects other than the actual mechanical work done. May also interest electrical shop courses as supplementary material. Maintenance guide presents facts on generation and distribution of electricity to homes, operation and repair of home appliances and small motors, safety hints.

**Vocational Training Series** (SVE, 19 films, si, about 74 frames each). This series differs from the "Careers" series, described above, in that much or detailed information is given about the actual daily work performed by the workers indicated in the individual titles. The emphasis is placed upon the actual steps in training rather than upon guidance. The filmstrips provide information concerning education and training required, qualifications, wage rates, advan-



tages and disadvantages of each type of work, apprenticeship training and daily duties. The series should be useful in vocational education classes or groups in high schools. The strips indicate possible future trends in each occupation, which may be amplified by the instructor if desired, and related to the local situation. Individual titles are listed below.

Auto Mechanics, Part I

Auto Mechanics, Part II

Brick and Stone Masonry

Cabinet Making

Carpentry

Cement Finisher

Electrical Workers

General Farming, Part I

General Farming, Part II

Highway Jobs

Machine Shop Mechanics

Molding and Coremaking

Painters and Decorators

Pattern Making

Plasterers

Plumbers and Steam Fitters

Sheet Metal Work

Structural Steel Workers

Welding as an Occupation

**Your Life Work Series** (Vocational Guidance Films, 2 series). This series is divided into two groups. The first group, "Job Classification," is based on the Dictionary of Occupational Titles, a classification used by the U.S. Employment Service. The seven major occupational groups are treated, with examples of typical jobs in various industries for both men and women. The second group, "Vocational Subjects," deals with specific fields of work, presenting various kinds of jobs and duties in each. In both groups, information concerning new types of work that have developed since 1940 would need to be added by the instructor. This series presents an over-all picture of various kinds of occupations, but does not include information on training or education required, or similar data. The films are suitable for use in high schools. Individual titles are listed below.

**Job Classification Series** (10 films, si, 50-60 frames each, manual).

Classification of Occupations

Professional and Managerial Occupations

Clerical and Sales Occupations

Service Occupations

Agriculture, Fishery, Forestry, and Kindred Occupations

Skilled Occupations (Part I)

Skilled Occupations (Part II)

Semi-Skilled Occupations (Part I)

Semi-Skilled Occupations (Part II)

Unskilled Occupations

Vocational Subjects Series (10 films, si, 50-60 frames each, manual).

Occupations in Aircraft Manufacturing

Occupations in Aircraft Operation

Tree Surgery

Osteopathy

Occupations in the Printing Industry

Occupations in the Steel Industry

Optometry

Occupations in Cement Manufacturing

Hotel Occupations

Railroad Occupations

See also the following titles for supplementary, illustrative and related materials:

Day on the Farm

General Farming

Boulevards of Steel

Railroad Family

Tree Surgery

Pilot Training Series

The Pilot

The County Agent

The County Home Demonstration Agent

Forest Ranger

Introduction to Machining Series

The Machinist

The Carpenter

The Roofer

The Woodcarver

Man Behind the Star



# Vocational Training

Wartime requirements for expanded vocational training have given impetus to visual aids production in this field; therefore, much recently produced material is available, presenting modern methods and equipment. Of course, this impetus has tended to provide a majority of filmstrips for those vocations most directly related to wartime needs, such as aeronautics and machine-shop work, other areas being neglected. One highly visual field, mechanical drawing, has been omitted almost entirely. Presently available filmstrips touch upon this basic subject only as it relates specifically to other vocations, such as aircraft construction. However, this surprising omission is being rectified by a forthcoming group of visual aids designed for use in conjunction with French's "Mechanical Drawing"<sup>1</sup> and "Engineering Drawing."<sup>2</sup>

Although much of the material now available was designed for use by industry, these strips should be of value in vocational schools. Some are also applicable for use in high school shop courses, such as woodworking, electrical work, and metal-working.

While actual practice and demonstration of the actual machines are the vocational instructor's greatest aids, the filmstrip can contribute by

1. Providing diagrams, cutaways, and similar drawings for rapid blackboard reproduction.
2. Showing small or hidden parts easily, particularly to large groups.
3. Introducing techniques or procedures to large groups prior to actual demonstration or practice, permitting the instructor to emphasize points to be observed most closely.

## AERONAUTICS

### CONSTRUCTION AND MAINTENANCE

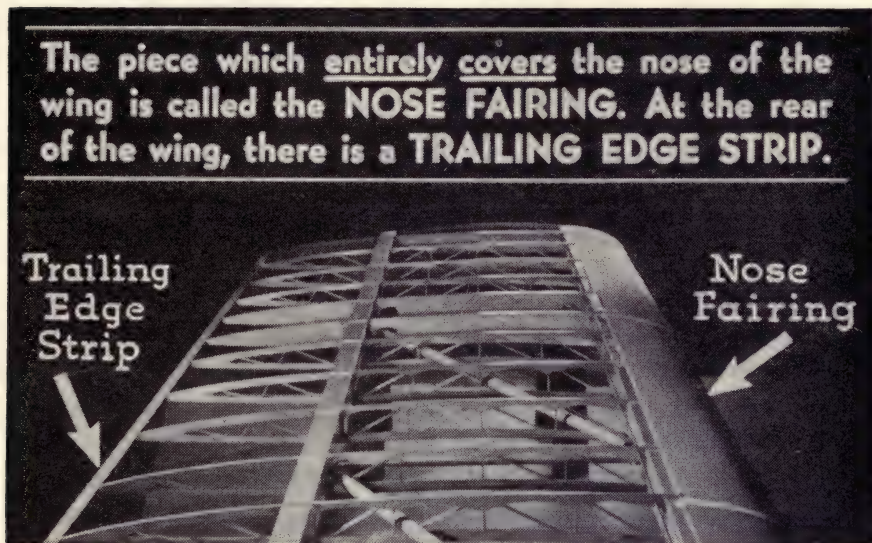
**Adjusting Mechanical Brakes** (Castle, made by U.S. Navy, No. SN 180, si, 41 frames). Procedures in preliminary checking of brake system, adjusting the brake,

<sup>1</sup> FRENCH, THOMAS EWING, and CARL LARS SVENSON, "Mechanical Drawing," McGraw-Hill Book Company, Inc., New York, 1940.

<sup>2</sup> FRENCH, THOMAS EWING, "Engineering Drawing," McGraw-Hill Book Company, Inc., New York, 1941.

making final adjustments of brake hookup. Importance of properly functioning brakes. Suitable for aircraft mechanics training.

**Aircraft Engine Mechanics** (Jam Handy, 24 films, si). Designed to present a point-by-point description of the principles, functions, operation, care, and repair of the modern aircraft engine. Treatment and subject matter is suitable for beginning aircraft mechanics classes. Some of the strips are long, containing much information for one class session, but may be shown in sequences if desired. Text



From the "Aircraft Mechanics Series." (Jam Handy Organization.)

frames and captions at times tend to be lengthy. Visualization in general is good, with many close-ups of small or inaccessible parts. Individual titles are listed below with brief descriptions.

**The Airplane Engine** (No. 1, 52 frames). Basic principles of operation of the four-stroke cycle internal-combustion engine. The cylinder intake and exhaust manifold; the piston, details of four-stroke cycle; crankshaft, connecting rod, valves; cam, camshaft, push rod, rocker arm, valve springs; valve timing; various engine types.

**Airplane Ignition** (No. 2, 59 frames). Function of ignition system in gasoline engine. Parts of system and purpose of each part. Diagrams explaining basic principles. Purposes of lubricating oil; two basic types of lubrication systems in aircraft engines.



**Engine Control Systems** (No. 3, 38 frames). Three types of controls described and explained: flexible wire and cable type; rigid tubing and wire type; push-pull type. Use of each for throttles, spark, mixture, choke, propeller, shutters, and oil heaters. Methods of adjusting, inspecting and lubricating controls and various types of control handles. Need for engine control system. Importance of correct adjustment.

**Flight Instruments** (No. 4, 87 frames). Illustrations and descriptions of altimeter, rate-of-climb indicator, air-speed indicator, magnetic compass, turn-and-bank indicator, artificial horizon. Mechanism and principle on which each works; uses, with instructions and compensation for deviation, temperature, and other factors.

**Engine Instruments** (No. 5, 53 frames). Purpose and use of tachometer, oil-pressure gauge, oil-temperature gauge; different types of gasoline gauges including simple float, distant-reading, and hydrostatic gauges. Parts, construction, basic principles of operation. Importance of checking instruments and adjusting correctly.

**Refueling the Airplane** (No. 6, 64 frames). Responsibility for refueling. Preparations before refueling. Safety precautions. Equipment required. Step-by-step procedure. Importance of grounding nozzle and plane, of avoiding static electricity, of keeping gasoline clean. Handling fuel hose. Methods of straining gasoline to remove water.

**Types of Fuel Systems** (No. 7, 63 frames). Working principles of mechanical and gravity-type systems. Tanks, sumps, strainers, selector valves, fuel lines, gauges of gravity system. Various types of mechanical pressure systems. Emphasis on vane-pump type. Advantages and disadvantages of mechanical and gravity systems.

**Inspecting the External Fuel System** (No. 8, 51 frames). Step-by-step procedure for inspecting pressure fuel systems. Use of red tag, counting tools and wiping cloths, cleaning tubing, checking for cracks, leaks, kinks, too much rigidity. Checking vibration connections, fuel-line supports; inspecting for chafing, hardened copper pipe, feed lines to primer, shutoff cocks, drain cocks, strainers, filler caps, air-breather lines, fuel and pressure gauges, primer, by-pass valve, hand pump, carburetor. Safety precautions; importance of proper checks and inspection.

**Oil Systems** (No. 9, 73 frames). How oil system works in V- and radial-type engines. Wet and dry sump systems. Traces oil flow from tank through external and internal system, pointing out parts. Indicates how to trace simple oil-line failures. Importance of 100 per cent lubrication.

**Checking Valve Clearance** (No. 10, 54 frames). Preparing engine for check. Checking parts of valve-operating mechanism. Importance of checking valve

clearance. Explanation of valve clearance and relation to valve timing. Results of excessive valve clearance.

**Adjusting Valves** (No. 11, 35 frames). Importance of checking valve clearance. Preparing engine for valve adjustment. Adjusting valves—checking with feeler gauge, and setting valve at correct clearance. Checking other valve mechanisms. Checking valves showing both normal and abnormal excess clearance. Emergency repair.

**Valve Operating Mechanisms** (No. 12, 76 frames). Definition and purpose of valve in internal-combustion engine. Position of valves in the four engine strokes. Characteristics of various valves and valve-operating parts. Functions of valve-operating parts. Valve positions in relation to engine operation. Valve timing.

**Push Rod Assembly** (No. 13, 46 frames). Functions; characteristics of various engine push rods and their importance; removal, inspection, maintenance, and assembly procedures. Illustrates push rods on Pratt and Whitney and Wright engines.

**Power Plant Lubrication** (No. 14, 45 frames). Different types of equipment required. Types of oil and greases. Lubrication of engine with each unit of engine discussed. Specific lubricating directions.

**Maintenance of Storage Batteries** (No. 15, 51 frames). Definition and importance of storage-battery maintenance. Proper installation; inspection and preparation before installation; handling instructions; making proper connections; periodic inspection and service; hydrometer check; electrolyte check; weather conditions affecting service. Recharging procedure.

**Servicing the Oil System** (No. 16, 41 frames). Checking and adding oil. Choosing the right oil. Checking oil for water. Recording oil added. Changing oil, when and how. Draining off old oil. Inspecting old oil. Refilling. Importance of checking for leaks.

**Cleaning the Power Plant** (No. 17, 45 frames). Reasons for keeping power plant clean. Safety rules. Selecting solvents and tools. Inspecting before and after cleaning. Procedure. Final inspection. Importance of discovering any possible defects.

**Magneto Ignition Maintenance** (No. 18, 41 frames). Importance of maintenance of external part of magneto-ignition circuit. Main parts of external circuit. Harness maintenance. Typical check procedure. Safety precautions. Use of tester, tagging and replacing bad leads; use of proper cable; checking magneto-switch wire.

**Fuel and Feed** (No. 19, 76 frames). Explanation of combustion. Atomized and vaporized gasoline. Purpose and operating principles of carburetor. Mixtures for internal-combustion engines. Fuel tanks and fuel lines. Carburetor



parts. Updraft and downdraft carburetors. Follows gasoline from fuel tank to combustion chamber. Automatic mixture controls. Pump and altitude controls. Primers and chokes.

**Methods of Starting** (No. 20, 46 frames). Procedures in seven methods of turning over an airplane engine: by pulling propeller; with shock cord; with direct hand crank; with combustion starter; with hand-operated inertia starter; with electric inertia starter; with direct electric starter. Procedures, precautions, signals.

**Gaskets** (No. 21, 43 frames). Definition and purpose of gaskets. Uses and examples. Jobs done which determine gasket materials for asbestos, copper bound, rubber, fiber, lead, cork vellumoid. Methods of preparing surfaces for gaskets. Making gasket patterns; cutting gaskets. Emergency gaskets. Precautions to follow in fitting gaskets.

**Propeller Maintenance** (No. 22, 61 frames). Different types of propellers. Servicing of metal types: cleaning, oiling, inspection, field repair, smoothing nicks and gashes, etching for cracks, straightening bent blades. Safety rules. Checking for alignment. Propeller-hub lubrication.

**Cold Weather Starting** (No. 23, 49 frames). Procedure in cold weather to overcome thick oil, stiff grease, moisture condensed as ice in engine and fuel line. Priming engine and heating oil. Checking spark plugs and other possible causes of trouble. Draining oil and water. Emergency measures.

**Servicing Hydraulic Systems** (No. 24, 47 frames). Importance of hydraulic system to safety of pilot and crew. Hydraulic system as operating retractable landing gear, brakes, wing and cowl flaps, bomb doors, gun turrets, propeller pitch, and wing-folding mechanism. Steps in routine check, repair, and replacement. Tracing common causes of trouble. Indications of external and internal leaks.

**Aircraft Engine Pumps** (Castle, made by Army Air Forces, No. FS 1-60, si, 38 frames). Construction, parts, and function of coolant, oil, fuel, and vacuum pumps. Mechanisms in gear, vane, and centrifugal pumps. Relief-valve operation, mechanisms and function.

**Aircraft Engine Repairs—Classification of Engine Types.** Castle, made by Army Air Forces, No. FS 1-9, si, 34 frames). Long shots of 1910 plane with old-type engine; modern plane with typical air-cooled engine, and with typical liquid-cooled engine. Methods of classifying aircraft engines as to type, showing cylinder arrangements, cylinder numbers, and firing orders: in-line, V-type, double V-type, X-type, opposed, radial engines. Briefly and clearly explained. Suitable subject matter treatment for aircraft mechanics, engineers, and pilot training courses.

**Aircraft Engine Troubles—General** (Castle, made by Army Air Forces, No. FS 1-66, si, 56 frames). A method for diagnosing engine troubles as local or general. Common engine troubles developing from mechanical failures, ignition-system or fuel-system failures. Troubles in compression and ignition systems. Causes of improper compression and of ignition troubles. Demonstrates systematic elimination of common engine troubles. Well-organized material, suitable for aircraft mechanic's training.

**Aircraft Engine Troubles: Starting** (Castle, made by Army Air Forces, No. FS 1-82, si, 62 frames). Difficulties in aircraft-engine starting and methods of overcoming such difficulties, as related to cold weather, carburetion troubles, compression troubles, ignition troubles, and starter troubles. Ends with review. Well-organized material. Suitable for aircraft mechanic's or pilot training.

**Aircraft Mechanics** (Jam Handy, 47 filmstrips, si). Procedures and equipment for aircraft maintenance, repair techniques, principles and operation of various mechanisms, and additional related information, such as nomenclature, information for mechanical drawing or layout work, handling of ropes and line, and basic information on plane performance. While designed for aircraft mechanics' training, many of the strips are adaptable to other courses, such as pilot training, mechanical drawing, electrical-shop work, and classes in mathematics for vocational schools. Although some of the strips are long and text frames or captions often tend to be lengthy, in general the material is well organized and pictorial content good. Individual titles with brief descriptions are listed below.

**Preparation for Fabric Covering** (No. 1, 40 frames). Cross-rib bracing on wing structures. Use of tape on wood and steel structure. Method of securing tape. Dope proofing. Fabric estimating—measuring to warp of material, seam allowances, total lengths, tape required, measuring total lengths.

**Inspection Before Fabric Covering** (No. 2, 71 frames). Need for inspection. Inspection of drag tubes, controls, electrical system, minor structures, fabric surfaces. Checking in wings, tail assembly, ailerons, and fuselage. The recheck.

**Hand Tools for Fabric Work** (No. 3, 56 frames). Descriptions and explanations of tools used. Proper care and use of pocketknife, shears (pinking and standard), pinking machine, needles (short, straight, curved, and long rib stitching), brushes for doping, grommets, and dies. Importance of proper fabric repair.

**Covering with Fabric** (No. 4, 65 frames). Procedures in covering wing structure. Includes sewing strips together, preparing structure interior; wires and cables; smoothing wrinkles; cutting; fitting; handling protrusions. Cover-



ing with blanket method, envelope, or slip-cover method. Tape reinforcing and rib-stitching surface; reinforcing patches. Doping. Importance of practice, neat appearance, good workmanship.

**Rib Stitching** (No. 5, 47 frames). Purpose of antitear strips. Cutting antitear strips from airplane cloth for wings. Applying and doping. Use of reinforcing tape. Applying tape. Stitching technique step by step; tools and cord used.

**Fabric Repair** (No. 6, 54 frames). How to repair punctures and tears in airplane fabric by patching. Types of patches. How to make patches. Sewing tears. Repairing large area. Repairing stretched but unbroken fabric.

**Mixing and Using Casein Glue** (No. 7, 46 frames). Content of casein. Keeping casein. Mixing methods—equipment, usual proportions. Checking consistency. Preparing joint, applying glue, clamping, wiping off excess, removing clamps. Operations in making the splice. Precautions.

**Soldering** (No. 8, 71 frames). Explanation of soldering and its uses. Definition of solder. Types of flux and their use. The copper and heat sources for soldering. The bit. Steps in soldering. Soldering sheet metal, cables, terminals, taps, and splices. Safety precautions (adaptable to electrical-shop work).

**Fabrication of Tubing** (No. 9, 79 frames). Explanation of steps in annealing, bending, fitting, and installing copper, aluminum, and dural tubing. Procedures in making pattern. Tools required and their use. Methods of making connections.

**Cable Splicing** (Part I, No. 10, 70 frames). Procedures in the five-tuck Navy splice. Material, tools, and methods used to replace spliced control cable connections. Precautions.

**Cable Splicing** (Part II, No. 11, 46 frames). Procedures in the Roebling roll splice. Material, tools, and methods. Step-by-step procedure for this type of splicing.

**Spray-painting Equipment** (No. 12, 64 frames). Typical spray-painting outfit. How it works. Types of air caps and how each works. Principal parts of gun and their operation. Material containers, types of cups, and tanks; agitators, air and fluid hoses—types and construction. Transformers and condensers, air compressors, air receiver, aftercooler, pressure switch, automatic unloader. Cutaway sections of all principal parts (applicable to any vocational classes interested in information on use of spray-painting equipment).

**Cleaning and Painting Tie Rods, Struts, and Sheet Metal** (No. 13, 52 frames). Care of various types of finished stainless steel, cadmium plating, or paint. Procedure for cleaning tie rods. Use of phosphoric acid cleaners, emery cloths, and steel wool. Application of primer paint, aluminum finishes, military

lacquers. Spot finishing. Finishing or refinishing struts and sheet metal. Proper coat application procedure and method of thinning mixtures and setting spray-gun nozzles.

**Care and Cleaning of Spray-painting Equipment** (No. 14, 49 frames). Importance of keeping spray-painting equipment clean and in good repair. Step-by-step procedure for cleaning pressure feed tank and pressure feed cup types of systems. Lubrication of gun and compressor; daily lubrication of parts of gun and compressor; maintaining constant level of oil in compressor crankcase. Safety precautions (applicable to any vocational classes interested in information on use of spray-painting equipment; see also film No. 12).

**Aircraft Tires** (Part I, No. 15, 35 frames). General description of aircraft tires. Descriptions of high-pressure, medium-pressure, and low-pressure tires; plain, cactus proof, and safety types of tubes. Inflation "do's" and "don't's." Care of casings. Danger to tires of too much heat, of cleaning with gasoline, of grease on tire. Inspection procedure. Maintenance precautions.

**Aircraft Tires** (Part II, No. 16, 57 frames). Procedures in demounting, repairing, and remounting tires. Includes demounting from drop-center rim and air wheel, inspection of tubes, cold patch and vulcanizing repair methods, inspection of casing, remounting, cleaning off rim and wheel, proper inflation procedures, testing, precautions to prevent straining structure of tire or tube.

**Emergency Seaplane Float Repair** (No. 17, 63 frames). Methods of bringing float repair kit into use. Inserting temporary rivets, making patches temporarily watertight. Type of repair as determined by distance from land or base of operations. Need for ingenuity.

**Adjustment of Hydraulic Brakes** (No. 18, 69 frames). Adjusting procedures on Bendix two-shoe expanding type of brake, Hayes expander-tube type, and Goodyear multiple-disk clutch type. Where to check for faulty hydraulic system. Methods of bleeding and pumping up Hayes type of system. Adjustment and sets of bell cranks. Bleeding and filling Goodyear type. Adjusting disks, adding new disks. Setting to proper tolerances. Precautions.

**Adjustment of Mechanical Brakes** (No. 19, 41 frames). Procedure for checking mechanical-brake adjustment, brake-pedal operation, cable and rod adjustments, and bell-crank setting. How to free brake lines. Testing and checking hookup. Setting shoes by adjusting eccentric or star. Keeping rudder clear of brake pedals.

**Geometric Construction** (Part I, No. 20, 41 frames). Material and tools needed; proper uses. Following constructions demonstrated: perpendicular bisector, dropping perpendicular from prick-punch mark, bisecting an angle,



perpendicular to the end of a line, parallel lines, layout of fillets between intersecting lines (applicable also to mechanical drawing and vocational mathematics classes; see also Part II, below).

**Geometric Construction** (Part II, No. 21, 35 frames). Following constructions shown: laying out fillets between a line and a circle or an arc; duplicating an angle; dividing a line; laying out angles with protractor. Types of protractors and their use. Practice problems.

**T-square and Triangles** (Part I, No. 22, 32 frames). Fundamental uses of T-square, 45 degrees and 30 to 60 degree triangles. Tools and equipment; correct care and usage. Setting up for drawing. Laying off margins. Reproducing title block of standard drawing form. Correct handling of hands, pencil, triangle, and T-square. Laying off vertical and horizontal lines, guide lines for lettering (applicable also to mechanical drawing classes).

**T-square and Triangles** (Part II, No. 23, 53 frames). Procedures and tools used in constructing simple figures containing angles. Six figures shown, drawing procedure step by step, allowing for student to draw while film is projected. Figures include layout of vertical and horizontal lines, layout of angle lines, squares, hexagons. Manipulation of triangle (applicable to mechanical drawing classes).

**Drawing an Anchor Plate** (No. 24, 20 frames). Tools needed; setup on drawing board. Step-by-step procedure in drawing an anchor plate as an aid in understanding principles of layout work. Students to draw as film is projected.

**Forces in Flight** (No. 25, 67 frames). Definition and functions of fuselage, landing gear, power plant, and control surfaces. Weight concentration point or center of gravity and center of pressure; parasite drag; wing friction; turbulence drag; interference drag. Factors of thrust. Glides. Climbing. Location of center of pressure relative to center of gravity. Flight characteristics caused by different forces. Corrections to counteract forces. (Film also applicable to pilot training.)

**Lift and Drag** (No. 26, 70 frames). Aerodynamics of airplane flight principles. Properties of air; effects of air flow on wing. Construction of wing, wing parts, types of airfoil sections. Principles of drag on airplane wing—how increased and decreased. Relation of lift to drag. Conditions affecting lift and drag. Wing-surface functions. Use of slots. Lift in a diving plane. Relation of angle of attack to stall—principles of stalling.

**Plane Performance** (No. 27, 90 frames). Definition and explanation of landing speed, cruising speed, maximum speed, range, endurance, rate of climb, time to climb to altitude, service ceiling, absolute ceiling. Factors determining performance; amount of lift, of weight, of thrust, of drag. Wing loading, power loading, safety pointers on safe load factors.

**Stability** (No. 28, 51 frames). Explanation of static and dynamic stability; lateral, longitudinal, and directional stability; negative, neutral, and positive stability. Forces affecting stability; methods by which plane gains stability. Relation of loads to stability.

**Hydraulic Struts** (No. 29, 45 frames). Need, use, and functions of hydraulic struts. Operating principles of hydraulic mechanism. Construction and operation of hydraulic shock absorber in simplified form and of airplane hydraulic strut. Coiled-spring type strut; combination pneumatic and hydraulic strut.

**Weather** (No. 30, 76 frames). Factors determining weather conditions. Cloud formation; 10 types of clouds—their movement, altitude, and temperatures. Diagrams of electrical storms, line squall, rains—warnings to pilots and procedure in avoiding storms. Weather forecasts—old superstitions, use of weather maps, and method of interpretation, Airways Weather Service.

**Air Pilotage** (No. 31, 76 frames). Need for pilot to know facts about ground below him. Study of aeronautical maps and charts: regional maps, topographical features—water, culture, and relief, landmarks, power lines, and towers. Charts: contour lines, airport markings and beacon lights, reserve areas. Methods in planning a flight; proper use of maps and charts. Formulas for time and speed; checking ground speed; checking gasoline supply; safety factors.

**Brake and Landing Gear Mechanism** (Part I, No. 32, 37 frames). Checking points of service on fixed landing gears. Inspecting supporting struts, shock-absorber units, brake assembly, tires, tail wheel.

**Brake and Landing Gear Mechanism** (Part II, No. 33, 70 frames). Inspecting and servicing retractable landing-gear mechanism. Operating mechanism. Checking struts and hinges; locking device; mechanical latch system; Bungee assembly; oleo strut; hydraulic brakes.

**Landing Gears and Brakes** (No. 34, 66 frames). Use of landing gear and brake working together. Operation of brake. Principle of friction governing braking action. Outline of knowledge needed for servicing of aircraft brakes. **Line** (No. 35, 67 frames). Difference between line, hawsers, rope, strand, thread in Navy vocabulary. Methods of coiling line to keep it ready for service; avoiding kinking; protection of line; methods of tying useful and standard knots. Details showing methods of whipping ends. Practice methods for proper heaving of line. Importance of knowledge of lines to seamen.

**Hydraulic Mechanisms** (No. 36, 49 frames). Principles of the hydraulic system. Where and how they are used in the plane. "Plumbing" system of an airplane. Tracing the system. Inspection for and checking of pressure. Contribution of hydraulic system to fast, safe flying.

**Cleaning the Airplane** (No. 37, 45 frames). Cleanliness and appearance as aids to inspection. Cleanliness as safety factor. Parts of airplane that need clean-



ing most often. Cleaning materials and compounds to be used on various metals. Methods for thorough cleaning. Inspection after cleaning.

**Care and Repair of Flight Controls** (No. 38, 37 frames). Methods of servicing cables, pulleys, tubes, hinges, and other fittings. Necessity for frequent checks. Starting checking and repair in cockpit, following controls to their termination. Importance of flight control checking and repair.

**Stresses in an Airplane** (No. 39, 64 frames). What forces and load on parts of an airplane make up "stress": pulling, compression, bending, shear, torsion. What kinds of material in airplane construction stand up best under various stresses; why these materials are used where they are used. How to recognize proper place to use proper materials. How kind of material and shape determine stress withstood. Importance of material, type of stress, and direction of stress to strong repair.

**Splicing a Line** (No. 40, 63 frames). Method of joining two pieces of line in a splice: tools, skills. Cautions that aid in avoiding mistakes. Definitions of terms used in line splicing. Procedures in making eye splice, long splice, and short splice. Uses of each splice.

**Major Assemblies and Disassemblies** (Part II, No. 42, 54 frames). Suggestions and hints on methods of assembling and disassembling major parts of an airplane. Essential tools and equipment. Includes tail-wheel assembly, aft end of fuselage, use of chain hoist for removal of landing gear.

**Major Assemblies and Disassemblies** (Part II, No. 42, 54 frames). Suggestions and hints on assembly of center section, wings, and tail group. Tools required. Securing electric conduits, bonding connections, and control connections in wings. Order of tail-group assembly.

**Rigging Changes after Flight Check** (No. 43, 43 frames). Causes of common faults in rigging. Methods of correcting the faults, including nose heaviness, improper loading, heavy tail or wings, misalignment of fuselage. Dangers of improper rigging. Overcoming swerving, yawing, ground hopping.

**Aircraft Nomenclature** (Part I, No. 44, 49 frames). Airplanes grouped as to type of wings, engine, propeller, landing gear, fuselage, empennage, and purpose.

**Aircraft Nomenclature** (Part II, No. 45, 42 frames). Parts of control surfaces, including wings, flaps, ailerons, rudder, elevators, fin, and horizontal stabilizer. Types of spars and ribs; how they are braced. How control surfaces operate; their effect on plane in flight. Use of aerodynamic balance in hinge and horn attachments.

**Aircraft Nomenclature** (Part III, No. 46, 58 frames). Names, locations, and purposes of various parts of seaplane floats and flying-boat hulls. Position of

steps and bulkheads. Details of structure in cross-section diagrams. Use of wing-tip floats and sea wings.

**Aircraft Nomenclature** (Part IV, No. 47, 34 frames). Names and purposes of cockpit instruments; cockpit controls of airfoil surfaces, engine fuel and lubrication; fire extinguishers.

**Aircraft Nomenclature** (Castle, made for U.S. Navy by Jam Handy, 4 parts, si). The same material as in the films of the same title in the "Aircraft Mechanics Kit" described above. Descriptions follow.

**Aircraft Nomenclature: Part I: Parts of the Airplane** (No. SN-60a, 48 frames). Classifications of airplanes by wing types, number and location of engines, type of landing gear, purpose of plane. Naval aircraft shown as examples. Basic nomenclature of typical Navy trainer and its power plant. Names and purpose of major assemblies.

**Aircraft Nomenclature: Part II: Wings** (No. SN-60b, 42 frames). Detail parts of airplane wing: location and function of spars, various types of ribs; materials from which they may be constructed; drag wires and antidrag wires; three types of flaps and their purpose. Airplane control surfaces—purpose and operation.

**Aircraft Nomenclature: Part III: Floats and Hulls** (No. SN-60c, 58 frames). Names, location, and purpose of seaplane floats and flying-boat hulls. Construction and parts of pontoon; functions of parts. Sections and parts of hull named and located; longitudinal and transverse bulkhead division.

**Aircraft Nomenclature: Part IV: Cockpits** (No. SN-60d, 34 frames). Location and purpose of instruments in primary trainer plane. Location, purpose, and operation of controls. Other equipment: fire extinguishers, fuse box, speaking tube.

**Aircraft Storage Batteries** (Castle, made by Army Air Forces, No. FS 1-17, si, 54 frames). Types of batteries used in airplanes and their operating principles. Electric circuit compared with water system; series, parallel, and series-parallel connections; composition of cell, connections as batteries; capacity of battery, rating batteries. Battery deterioration, maintenance, locations in planes. Charging and testing procedures. Functions of container, plates, separators, electrolyte, vents and terminals. Much information for one class session but may be shown in sequences if desired. Organization at times difficult to follow. Visualization in general good.

**Aircraft Tires** (Castle, made for U.S. Navy by Jam Handy, Nos. SN 491a and SN 491b, 2 parts, si). The same material as filmstrips of the same titles described above under "Aircraft Mechanics Kit."



**Aircraft Work Series** (Castle, made by USOE, 6 groups, 17 filmstrips, si, manuals). Designed specifically for use in conjunction with motion pictures of the same titles, but may be used independently, particularly for review purposes or as discussion guides. The filmstrips review information presented in the motion pictures by photographs and diagrams with question or problem captions and by some summary of important points. Individual titles are listed below. Descriptions are not provided since the titles are self-explanatory.

**Inspection** (5 filmstrips).

Inspection of Sheet Metal Parts (No. OE 145).

Inspection of Minor Assemblies (No. OE 146).

Inspection of Plumbing and Piping (No. OE 147).

Inspection of Threads (No. OE 148).

Hardness Testing (Rockwell) (No. OE 149).

**Tube Bending** (1 filmstrip).

Tube Bending by Hand (No. OE 142).

**Control Cables** (3 filmstrips).

Making a Five-Tuck Splice (No. OE 143).

Making a Wrapped and Soldered Splice (No. OE 144).

Swaging Cable Terminals (No. OE 298).

**Finishing** (1 filmstrip).

Using a Portable Spray Gun (No. OE 289).

**Wood Fabrication** (6 filmstrips).

Laying Out and Forming Plywood (No. OE 285).

Building a Box Beam Spar (No. OE 297).

Building a Wooden Rib (No. OE 296).

Wing Assembly: The Nose Section (No. OE 299).

Wing Assembly: The Inboard Panel (No. OE 300).

Wing Assembly: The Bow Tip (No. OE 284).

**Metal Fabrication** (1 filmstrip).

Fabricating Metal Aircraft (No. OE 288).

**Airplane Flight Control Surfaces and Wing Flaps** (Castle, made by Army Air Forces, No. FS 1-29, si, 65 frames). Primary control surfaces: location, effects, balance, structure, inspection, and maintenance. Secondary control surfaces: location, construction, operation, structure, inspection, and maintenance. Wing flaps and slots—types, location, construction, and operation. Clearly organized so that selected sequences may be shown as required. Pictorial material good.

**Airplane Maintenance Series** (Castle, made by USOE, 3 groups, 36 filmstrips, si, manuals). Designed specifically for use with motion pictures of the same titles, but may be used independently, particularly for review purposes or as discussion

guides. The strips review information presented in the motion pictures using photographs and diagrams with question or problem captions and some summary of important points. Individual titles are listed below. No descriptions are provided since the titles are self-explanatory.

**Preventive Maintenance (6 filmstrips).**

- The Airplane Mechanic (No. OE 278).
- Servicing an Airplane (No. OE 279).
- Preflight Inspection—Airplane (No. OE 280).
- Preflight Inspection—Engine (No. OE 281).
- Periodic Inspection—Airplane (No. OE 282).
- Periodic Inspection—Engine (No. OE 283).

**Aircraft Maintenance (14 filmstrips).**

- Repairing a Wooden Rib (No. OE 247).
- Splicing a Wooden Spar (No. OE 248).
- Patching Plywood (No. OE 249).
- Patching Fabric (No. OE 250).
- Making Sheet Metal Repairs (No. OE 252).
- Repairing Structural Tubing (No. OE 253).
- Repairing Aircraft Tires (No. OE 254).
- Inspecting and Adjusting Hydraulic Brakes (No. OE 255).
- Repairing and Relining Mechanical Brakes (No. OE 256).
- Installing Landing Gear (No. OE 257).
- Attaching and Aligning Wings (No. OE 258).
- Connecting and Adjusting Controls (No. OE 260).
- Installing and Aligning Tail Surfaces (No. OE 259).
- Adjustments after Check Flight (No. OE 261).

**Power Plant Maintenance (16 filmstrips).**

- Removing and Inspecting Cylinders (No. OE 262).
- Inspecting and Reconditioning Piston Assembly (No. OE 263).
- Inspecting and Reconditioning Valve Assembly (No. OE 264).
- Servicing Spark Plugs and Ignition Wiring (No. OE 265).
- Overhauling the Carburetor (No. OE 267).
- Disassembling the Engine (No. OE 268).
- Servicing and Timing Magnetos (No. OE 266).
- Overhauling Crankshaft Assembly (No. OE 269).
- Overhauling Camshaft Assembly and Crankcase Section (No. OE 270).
- Reassembling the Engine (No. OE 271).
- Engine Change: Removal (No. OE 272).



**Engine Change: Installation** (No. OE 273).

**Trouble Shooting Problems: Mechanical and Lubrication** (No. OE 274).

**Trouble Shooting Problems: Ignition** (No. OE 275).

**Trouble Shooting Problems: Fuel Induction** (No. OE 276).

**Servicing a Propeller** (No. OE 277).

**Aviation Metalsmiths** (Jam Handy, 16 filmstrips, si). The fundamentals of metalsmithing, particularly as applied to airplanes, and step-by-step demonstrations of various operations. Although designed specifically for aircraft work, these strips are adaptable for use in any beginning metalworking class. Film No. 7 ("Properties of Metals," Part II) is concerned specifically with airplane metals, and may not interest other classes. The two filmstrips on properties of metals (films No. 6 and 7) may also interest physics or engineering classes as supplementary material. Individual titles are listed below with brief descriptions.

**Tool Box** (3 parts, supplementary printed material).

**Part I** (No. 1, 43 frames). Bottom and sides: importance of toolbox for metalsmiths. Making and assembling of bottom, sides, ends, and corner reinforcements. Includes laying out for trim, bends, flanges, offsets, hems, beads, slots, corners, and rivet holes; forming of parts by hand shears, squaring shears, hand snips, cornice brake, bar folder, bending rolls; center punching, drilling, regulating, and riveting.

**Part II** (No. 2, 29 frames). Top and tray: making and assembly. Includes laying out, fabricating, scribing center lines; bending top, bend-angle formula; forming rivet holes, slots, hems, and bend lines; use of tinsmith's oval-head rivets; square drilling and riveting of end pieces.

**Part III** (No. 3, 49 frames). Hardware. Need for simplicity and practicality. Hardware designs. Laying out and forming; assembly of simple hinges, hasps, staples, staple plates, sleeve-type handles, hand clips, tray supports, tray stops. Adding rod work to sheet-metal work. Fitting and setting in place of hardware. Finished toolbox painted and ready for use.

**The Metalsmith's Tool Kit** (No. 4, 56 frames). How tool kit is designed to hold special tools for special work. Use of proper tools to do the work. Standard names and descriptions. Care of tools to keep them accurate and in service. Standard scales and rules used.

**Repairing Sheet Metal Surfaces** (No. 5, 60 frames). Classification of repairs most often needed. How to make these repairs. Procedures in removing dents, repairing cracks, repairing holes, replacing panels. Indicates changing specifications and slight damages being really major damages that weaken entire structure. Safety precautions included.

**Properties of Metals** (Part I, No. 6, 64 frames). Definition and examples of metals and alloys. Base metal and alloying elements. Properties discussed and defined and tests for each: tensile strength, compressive strength, elasticity, toughness, ductility, malleability, brittleness, hardness, fusibility, corrosion resistance. Methods of working metal—rolling, casting, forging. Heat-treating—reasons, examples of processes, and their purpose.

**Properties of Metals** (Part II, No. 7, 39 frames). Metals and alloys used in airplane construction. Discussion of the following metals, their uses in planes, and their classifications as to chemical composition: steels, aluminum (alloys), copper, brass, bronze, Monel metal, inconel, Stellite, magnesium. Section on aluminum includes some data on working of aluminum alloys.

**Protection of Metals** (Part I, No. 8, 53 frames). Opens with sequence on importance of protection of metal parts, particularly in airplanes. Explanation of oxidation and intercrystalline corrosion. Methods of protecting surfaces: plating and coatings—cadmium plating, galvanizing, hot-dip process, Sheradizing, Parkerizing, metalizing. Anodizing process. Metal greasing. Use of light oil, application of Lion oil, polishes, painting, and varnishing.

**Protection of Metals** (Part II, No. 9, 30 frames). Finishing materials: examples, discussion, use in planes—enamel, lacquer, special finishes. Waterproofing. Preparing metals for finishing. Application of finishes. Metalizing surfaces. Spraying lacquer.

**Slotted Anchor Plate** (No. 10, 40 frames). Step-by-step procedure in making slotted anchor plate as test of ability. Specifications, tools, laying out, blanking, hack-saw fitting, filing, checking limits, drilling, slotting, cutting lightning hole, smoothing, and cleaning. Machines and tools used.

**Internally Threading a Plate—Making a Stud—Extracting a Broken Stud** (No. 11, 44 frames). Drilling holes for tapped threads, proper use of complete tap set, cutting external threads, removal of broken studs without injuring surrounding parts, procedure in making a stud.

**Hinge Fitting** (No. 12, 22 frames). Making fittings and bending to definite shapes. Use of bending blocks. Tools needed. Step-by-step procedures.

**Grinding and Sharpening** (No. 13, 17 frames). Proper methods of sharpening tools on electric grinders. Safety precautions. Sharpening twist drills—procedure. Checking drill angles with drill gauge.

**Making and Drilling Riveted Patch—Hand and Pneumatic Riveting—Removing Rivets** (No. 14, 62 frames). Laying out and making patches for repair of sheet-metal structures. Use of straight shears. Method of drilling patches. Use of machine screws and rivet clamps. Procedures in hand riveting and pneumatic riveting. Removal of rivets.



**Flanged Parts Tray** (No. 15, 65 frames). Layout procedure when bend allowances must be computed. Stretching metal over forms. Making flat patterns or stretch-outs. Rolling and breaking sheet metal to dimensions. Squaring shear, cornice brake, bar folder. Forming angles to curves. Assembling, fitting, and riveting parts.

**Metal Finishing** (No. 16, 59 frames). Various types of metal-finishing processes: pickling, sandblasting, chromium plating, cadmium plating, anodizing, and metalizing. Kinds of metals that can be treated with each process. Knacks and cautions for the metal finisher. Special attention to metal finishing the metals used in airplane construction.

**Care and Repair of Flight Controls** (Castle, made for U. S. Navy, No. SN-127, si, 69 frames). Importance of periodic and frequent inspection of control system. Systematic procedure for inspecting and cleaning of cables, pulleys, fair-leads or guides, and hinges. Proper lubrication. Procedures for inspection and care of push-pull and torque tube systems. Complete inspection of typical plane control system given as review, using questions to point out what to look for. Organization, treatment, and visualization good. Review device particularly well presented.

**Cleaning and Painting Tie Rods and Struts** (Castle, made for U.S. Navy by Jam Handy, No. SN-23, si, 52 frames). Same material as strip of same title described under "Aircraft Mechanics Series" above.

**Cleaning the Airplane** (Castle, made for U.S. Navy by Jam Handy, No. SN-121, si, 45 frames). Same material as strip of same title described under "Aircraft Mechanics Series" above.

**Connecting Rods and Crankshafts, Bearings and Crankcases** (Castle, made by Army Air Forces, No. FS 1-35, si, 43 frames). Purpose, essential parts, construction, and operation. Main types of connecting rods, crankshafts, bearings, and crankcases. Clearly presented information for aircraft mechanic's training.

**Cylinder and Piston Assemblies** (Castle, made by Army Air Forces, No. FS 1-27, si, 32 frames). Parts and function of air-cooled and liquid-cooled cylinder assemblies valves, and valve-operating mechanisms. Construction and operation. Subject matter and treatment suitable for airplane mechanic's training.

**General Principles of the Propeller** (Castle, made by Army Air Forces, No. FS 1-104, si, 51 frames). Principles of the propeller in terms of its operation and construction. Propeller terms, types of construction, causes of failures; factors determining shape of blade. Explanation of thrust, pitch, angle of attack, slip, feathering, and windmilling. Principles presented more clearly than in No. SN 952 "The Story of Aircraft Propellers," described below. Subject matter and treatment suitable for mechanic's or pilot's training.

**Generator and Regulator Systems: Principles** (Castle, made by Army Air Forces, No. FS 1-53, si, 65 frames). Operating and construction principles of generator and regulator systems. Vibrating voltage regulator and the cutout relay explained. Parts and their functions. Somewhat long for one class session, but may be shown in sequences as desired.

**Handling the Airplane** (Castle, made by U.S. Navy, No. SN-252j, si, 45 frames). Dangers of careless handling of an airplane on the ground. Indicates proper procedures, using a primary trainer for illustration. Includes care in getting into and out of plane; moving the plane; tying down a plane; proper use of tractor in moving plane. Deals with a fabric-covered plane and a metal-covered plane. Dangers and proper techniques effectively presented.

**Hand Tools for Fabric Work** (Castle, made for U.S. Navy by Jam Handy, No. SN-102, si, 56 frames). The same material as filmstrip of same title described under "Aircraft Mechanics Series," described above.

**Inspection and Service of the Wright Cyclone 9 GC** (Wright, 3 parts, sd, about 15 min each, loan). Although the filmstrips deal with one type of engine, they are adaptable for use in aeronautical-maintenance training courses. Each inspection and servicing step is shown in detail with captioned close-up photographs. The recorded lecture presents detailed information concerning each procedure. The three parts are listed below with indications of subject matter covered.

**Part I** (79 frames). Recommended procedures for engine inspection of the 9 GC Cyclone, including check sheet, inspection of engine for fuel and oil leaks; washing and drying the engine; draining oil sump and checking magnetic plug and strainer, removing, inspecting, and cleaning Cuno oil filter, removing and visually inspecting spark plugs, checking cylinder compressions. Review.

**Part II** (68 frames). Brief review of Part I. Continuation of inspection: checking valve clearance; checking magnetos and installing reconditioned spark plugs; inspecting engine harness; checking all external nuts, bolts, and cap screws. Review.

**Part III** (59 frames). Brief review of Parts I and II. Continuation of inspection: checking thrust-bearing unit; checking engine controls; correcting any oil or fuel leaks noted in operation one; inspecting carburetor strainer; inspecting exhaust system. Review of all 15 inspection items presented in the three parts.

**Intake and Exhaust Systems** (Castle, made by Army Air Forces, No. FS 1-64, si, 36 frames). Diagram showing major elements of simple intake and exhaust system: purposes, function, and operation of parts. Radial and V-type engine



systems shown. Explanation of supercharger. Inspection and maintenance procedures. Well visualized, particularly in diagram frames.

**Line** (Castle, made for U.S. Navy by Jam Handy, No. SN-53, si, 67 frames). Same material as filmstrip of same title described above under "Aircraft Mechanics Series."

**Major Assemblies and Disassemblies** (Castle, made for U.S. Navy by Jam Handy, 2 parts, Nos. SN-135a and SN-135b, si, 48 and 54 frames). Same material as filmstrips of same title described above under "Aircraft Mechanics Series."

**Preserve the Original Strength** (Castle, made by U.S. Navy, No. SN-294, si, 56 frames). Stresses importance of preserving strength of every part of plane; plane as safe as strength of weakest point. Need for strength and lightness. Five types of loading stresses explained: tension, compression, shear, bending, and torsion. How airplanes are built to withstand these stresses—details of construction. Procedures in patching or reinforcing to maintain original strength, particularly in wings and fuselage. Somewhat long for one class session, but may be shown in sequences if desired although organization of subject matter requires careful preview for selection of such sequences.

**Removing, Cleaning and Replacing Cowling** (Castle, made by U.S. Navy, No. SN-166, si, 53 frames). Procedures in removal of common types of cowling, showing the various types of cowling fasteners used. Information on inspection and cleaning procedures. Safety precautions. Well organized although somewhat long.

**Repairing Channels and Stringers** (Castle, made by U.S. Navy, No. SN-297, si, 68 frames). Function of channels and stringer. Methods of repair. Demonstrates forming a splice for channel-type stringer with bending brake, steel form blocks, and wood form blocks. Heat-treatment methods for hardening reinforcements. Well presented, but somewhat long.

**Rigging Changes after Flight Check** (Castle, made for U.S. Navy by Jam Handy, No. SN-136, si, 43 frames). Same material as filmstrip of same title described under "Aircraft Mechanics Series."

**Splicing a Line** (Castle, made for U.S. Navy by Jam Handy, No. SN-933, si, 63 frames). Same material as filmstrip of same title described above under "Aircraft Mechanics Series."

**The Story of Aircraft Propellers** (Castle, made by U.S. Navy, No. SN-952, si, 65 frames). Brief history of aircraft propellers. Nomenclature and location of parts. Basic principle on which all propellers work. Types of propellers, their advantages and disadvantages. Importance of handling propellers with care. General and introductory material concerning propellers.

## THEORY AND HISTORY

**Aerial Navigation: Radius of Action Returning to Same Base** (Castle, made by Army Air Forces, No. FS 1-67, si, 17 frames). Radius of action defined; factors determining radius of action; explanation of factors; mathematical formulas used in plotting radius of action returning to the same base demonstrated. Briefly and clearly presented, explaining calculation of radius of action effectively.

**Aerial Navigation: Radius of Action Returning to Alternate Base** (Castle, made by Army Air Forces, No. FS 1-68, si, 16 frames). Typical problem concerning radius of action returning to alternate base solved through development of factor diagram. Effect of data change explained. Calculation method presented clearly, briefly, and effectively. May be used with No. FS 1-67, described directly above. Both strips may be of some interest as supplementary material to physics classes.

**Aerodynamics** (Castle, made by Army Air Forces, No. FS 1-8, si, 59 frames). Describes motion of air and force it exerts upon moving solids; way in which turbulence and skin friction oppose useful dynamic reaction. Includes lift and drag, thrust and drag, forces in equilibrium in plane during flight; airfoils; relative wind; diagrams showing relative wind acting on airfoil producing lift and drag; angle of attack; formula for lift and drag; wind tunnel uses; finding angle of incidence, relation to position of plane and angle of attack; inertia of air opposing change in direction, effects of surface irregularities; fineness ratio, effects of various airfoil designs; streamlining of airplane parts. Effectively visualized presentation of the fundamentals of aerodynamics. Organization good, allowing for natural division into sequences if desired. This strip may also interest general science and beginning physics classes.

**Aircraft Engine Operation** (Castle, made by Army Air Forces, No. FS 1-72, si, 67 frames). Procedures for starting, warming up, ground testing, and stopping aircraft engines. Operation illustrated under various flight conditions. Also of interest for aircraft mechanic's or ground crew training.

**Elementary Pilot Training—Part II—Effect of Controls** (Castle, made by Army Air Forces, No. FS 1-98, si, 54 frames). Functions and locations of the basic controls. What happens when each control is used. Explanation of coordination of controls and their proper use. Includes the stick, rudder pedals, proper control pressures, use of controls in turning maneuvers. Effectively visualized and well organized.

**Instruments** (Castle, made by Army Air Forces, 5 filmstrips, si). A detailed introduction to aircraft instruments, their use, operating principles, inspection, and maintenance. Although the filmstrips tend to be lengthy, the organization is



such that selected sequences may be shown as desired. Individual titles follow, with brief descriptions.

**Introduction to Airplane Instruments** (No. FS 1-23, 61 frames). Purposes of aircraft instruments. Principles of instrument operation. Principles of electrical and mechanical types. Includes measuring pressure; electrical or magnetic qualities; indicating frequency of an occurrence; establishing fixed position or direction in space from which movement can be measured; measuring movements between objects by mechanical linkage.

**Thermometers** (No. FS 1-51, 53 frames). Use, operation, and maintenance of various types of aircraft thermometers. Includes coolant, cylinder, carburetor mixture, oil, and air. Principles of vapor pressure, electrical, and thermocouple-type thermometers. Maintenance procedures for each. Ends with review.

**Pressure Gauges** (No. FS 1-52, 52 frames). Application of pressure gauges on aircraft. Principles and operation of Bourdon mechanism, diaphragm mechanism, and aneroid mechanism.

**Tachometers and Synchronism Indicators** (No. FS 1-26, 51 frames). Operating principles, inspection, and maintenance procedures for chronometric and generator voltmeter tachometers and engine-synchronism indicator on multiple-engine aircraft.

**Fuel Level Gauges** (No. FS 1-58, 41 frames). Operating principles, maintenance, and inspection procedures for mechanical and electrical gauges. Purpose of such gauges; types. Liquid-pressure gauges, mechanical type, electrically operated.

**Pilot Training** (Jam Handy, 3 kits, 24 filmstrips, si). Designed specifically for beginning aeronautics and pilot preflight training. Several of the strips may interest other classes also as indicated in the individual descriptions. Photographs and diagrams with captions and some text frames. In general, the strips tend to be lengthy, containing much material for one class session, except when used as review. It may be desirable to show the strips in sequences rather than in entirety for the first showing. Titles are listed below with brief descriptions.

**Kit 1** (6 filmstrips).

**Men and Wings** (No. I-1, 55 frames). History of development of aeronautics from early myths to the First World War. Includes contributions of the following: Leonardo da Vinci, Cayley, Henson, Stringfellow, Wenham, ornithopters such as de Villeneuve and Hargrove, Edison, Ader, Phillips, Maxim, Chanute, Pilcher, Lilienthal brothers, Langley, Curtis Company, and the Wright brothers; use in the First World War, famous fliers, effect on aviation. May also interest general science classes, or social studies groups interested in study of transportation.

**Today's Wings** (No. I-2, 44 frames). Record of aeronautical development and advance from end of the First World War giving briefly important flights, important records made, and famous fliers. Indicates contributions of barnstormers, transatlantic flights, round-the-world flights, Pacific flights, transcontinental flights. More recent developments shown as carefully planned with era of "show off" flying over. Importance as link in industry and commerce. Includes carrier system, continental passenger lines, foreign transport and passenger service, increase in licensed pilots. Aviation as an industry. Developments during and after the Second World War not included. Strip may be of interest with "Men and Wings" in general science and social studies classes.

**Aircraft Regulation** (No. I-3, 36 frames). Need for centralized regulation; the Civil Aeronautics Board and Civil Aeronautics Administration. Types, classes, and limitations of aircraft certificates, including certificate of registration, airworthiness certificate, the three classes of certified planes. Purpose of regulations. Identification marks on planes. Required lights. Required aircraft logbooks and engine logbook.

**The Pilot** (No. I-4, 46 frames). Responsibilities of the pilot, his ratings and limitations. Explanation of student certificates, private certificates, and commercial certificates. How each is earned, requirements, limitations. Special competency ratings: instructors, for instrument flying, for airline pilots. Certification according to class of plane—classes of planes indicated and explained briefly. Regulations concerning dropping of objects from plane; passengers under influence of drugs or liquor, reports of accidents.

**Traffic** (No. I-5, 57 frames). General air traffic, right of way, minimum altitudes for flight; weather minimums; flight on civil airways. Need for rules as on streets, roads, and sea. Aircraft regulations on above items given briefly and illustrated. Traffic control: civil airways, control towers and operators, control zones of intersections, air-space reservations defined and explained. Weather: visibility, ceiling, contact flight. Effects of weather on rules for contact flight within control zone. Minimums for acrobatic flying.

**Radio and Control** (No. I-6, 63 frames). Use of radio and other means of controlling flow of traffic around airports. Need for exchange of information between ground and plane. Functions of airport control tower, of control tower operator—use of lights, flags, and radio. Examples showing use of light and flag signals, answers by pilot signaled with airplane. Use of radio communication: to plane with receiver but without transmitter; with two-way radio. Radio-telephone permit. Standard phrases and terms



used. The three parts of the standard message and purpose of each. Examples of communication between control tower and pilot coming in for landing. Examples of other signals used, including flashing red lights or red flag, rotating beacon, flashing amber light, pilot's signals concerning floodlights or forced landing; international-code flag signals.

**Kit II (10 filmstrips).**

**Lift and Drag** (No. II-1, 70 frames). Described under "Aircraft Mechanics Series" in Construction and Maintenance section above.

**Wing Forces** (No. II-2, 66 frames). Contributions to flight by fuselage, landing gear, power plant, and control surfaces illustrated. Total weight of plane: action of weight, center of gravity, center of pressure, effect of varying forces, of lift and drag, parasite drag causes, center of drag. Thrust—supplied by propeller, variations, relation of thrust and drag to speed. Forces in dives and climbs. Changes in center of pressure. Importance of location of CP. Devices for balancing plane and effect of each. Downwash effects. Speed and control surface area effects.

**Stability** (No. II-3, 52 frames). Described under "Aircraft Mechanics Series" in Construction and Maintenance section above.

**Plane Performance** (No. II-4, 91 frames). Definition of plane performance and elements considered. Effects of lift, weight, thrust, and drag on performance factors. Effects of power loading and wing loading. Load-factor control. Explanation of cleanness ratio and power available, angle of climb. Structure of plane for dynamic loads. Load factors in various maneuvers. Safety pointers for safe load factors.

**Check and Double Check** (No. II-5, 46 frames). Responsibility of pilot to check his airplane. Examples of fastenings with cotter pins, safety wire, and other devices. Suggested check list of major parts of airplane: step-by-step inspection procedure indicating what each unit should be checked for. Double checking during flight. Importance of checking and inspection for safety in flying.

**The Airplane Engine** (No. II-6, 52 frames). Described under "Aircraft Engine Mechanics Series" in Construction and Maintenance section above.

**Fuel and Feed** (No. II-7, 76 frames). Described under "Aircraft Engine Mechanics Series" in Construction and Maintenance section above.

**Airplane Ignition** (No. II-8, 59 frames). Described under "Aircraft Engine Mechanics Series" in Construction and Maintenance section above.

**Engine Instruments** (No. II-9, 39 frames). Importance and functions of engine instruments; principles of operation. What to look for; indications that gauge is inaccurate; what gauges can tell the pilot. Stress on proper

care and handling of all engine instruments. Includes tachometer, oil-pressure gauge, oil-temperature gauge; gasoline gauges. Hydrostatic gauge, distant-reading and simple types shown.

**Parachutes** (No. II-10, 66 frames). Construction, care, and use of parachutes. Brief résumé of development. Construction of modern chutes; standard sizes, pack types, material, harness, shroud lines, pilot chute. Care: repacking, minor repair, procedures in packing and double checking airworthiness, defects to look for, care of damp chutes, prevention of mildew and rust, proper carrying; need for proper fit. Use: methods of leaving the plane, releasing the chute, checking swing or turn tendency during fall; other suggestions such as position of legs, steering away from obstruction, landing, etc.

**Kit III (8 filmstrips).**

**The Air Ocean** (No. III-1, 69 frames). Atmosphere, meteorological elements, meteorological instruments. Definition of meteorology, weather and climate; importance of weather to pilot. Comparison of air with ocean of water; description of layers; behavior; air as a gas. Basic atmospheric conditions; changes affecting weather elements. Temperature—effect of sun, of earth's rotation, of radiation and conduction, convection; vertical temperature gradient, use of thermometer. Pressure—air weight, equality of pressure, change with altitude, use of barometer, barometer types. Effect of temperature and pressure on air balance; expansion and contraction, movements of warm and cold air; adiabatic temperature changes, equalization of pressures causing wind, updrafts and downdrafts. Importance of wind direction and velocity—uses of wind sock, wind vane, anemometer, theodolite, and pilot balloon. Humidity—definition, evaporation, effect of temperature, saturation, relative humidity, condensation, dew point, measuring with psychrometer. Formation of clouds, causes of precipitation. Measuring "ceiling." May also interest classes in general science, principles or elements of geography, elementary meteorology.

**Air Masses** (No. III-2, 68 frames). Summary of development of storm center and atmospheric conditions resulting in a low. Prevailing winds of the earth, causes, location of general highs and lows, effect of rotation. Classifications as to temperature and humidity of climates. Effect of cold and warm air masses meeting: polar front, formation of a low, cold front, warm front; cross section of low showing air movements and effect on weather; conditions causing clouds, local showers, other precipitation. Occlusion, isobars. Movement of air in a high. Typical weather map. Precipitation—general causes, fog as flying hazard, types of fog and their



causes. Temperature inversion. Gusts and squalls. Ending sequences emphasize points important to pilots; rest more general and may interest classes in general science, principles of geography, or elementary meteorology.

**Weather** (No. III-3, 76 frames). Described under "Aircraft Mechanics Series" in Construction and Maintenance section above. May also interest classes in general science, principles of geography, or elementary meteorology.

**Air Pilotage** (No. III-4, 76 frames). Described under "Aircraft Mechanics Series" in Construction and Maintenance section above.

**Dead Reckoning** (No. III-5, 85 frames). Definition of dead reckoning; problems all involve distance and direction to find position. Measurement of direction on earth's surface. Use of Lambert conformal conic projections—advantages and procedures. Procedure in true course measurement. Correcting for magnetic variation, for effects of wind. Use of formulas. Presents two complete problems: (1) planning a course, (2) rectifying a course and finding position. Major points summarized and outlined.

**Airway Aids** (No. III-6, 68 frames). Governmental navigational aids: beacons, markers, and ranges. Early aids, development of standard markers, and airways aids. Landing fields: markings for day or night flight; of obstructions; beacon towers. Purpose and meanings of beacons; types. Radio range: purpose, explanation, method of using. Problem showing how ranges are used for orientation. Weather reports. Other radio aids. Aids through improved equipment: radio compass, radio direction finder; radio instrument landings. May also interest physics or radio classes as supplementary material on applications of radio.

**Flight Instruments** (No. III-7, 87 frames). Described under "Aircraft Engine Mechanics Series" in Construction and Maintenance section above.

**Pilot Problems** (No. III-8, 40 frames). Practical examples of navigation problems and how to solve them; review of formulas. Includes basic formula for any problem involving speed, time, and distance, sample problems; course correction; finding flying time; radius of action; finding ground speed inbound; orientation to radio range; true air speed; correction of altimeter for altitude. Might be of some interest to advanced mathematics classes as supplementary material, providing examples of specific problems and application of information.

**Theory of Flight** (SVE, 4 parts, si, 35-50 frames each). Designed to accompany Gilmer and Nietsch text "Simplified Theory of Flight." Diagrams and graphs,

with a few photographs, accompanied by captions and text frames. The captions and text frames tend to be lengthy, reducing legibility and extent of visualization. Much information for one class session, but selected sequences or single frames may prove of interest particularly for blackboard reproduction. Titles of parts are listed below; descriptions are not included as titles are self-explanatory.

Part I—The Airfoil

Part II—The Complete Airplane

Part III—Control of the Plane

Part IV—Stability and Performance

See also the following series and individual titles for supplementary, illustrative, and related materials:

The Aeroplane and Historical Development

Airships and Historical Development

Air Transportation Series

Meteorology and Navigation

Global Concepts and the Age of Flight

Air Age Physics Series

Fluids Series

Principles of Liquids and Gasses

Light on Mathematics Series

Vectors

## AUTOMOTIVE OPERATION AND MAINTENANCE

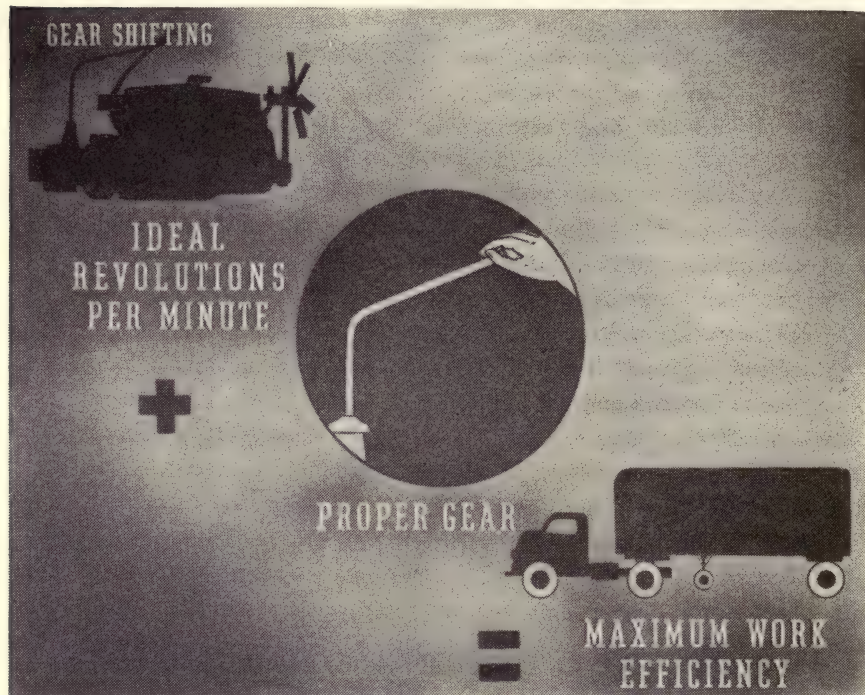
**Allen Course of Modern Engine Tune-up** (Allen, 2 filmstrips, si, manual). Several frames for each lesson in the manual providing diagrams and cutaways for illustration. Subject matter includes principles of a gasoline engine; battery and starter circuit, condenser, secondary circuit, radio suppressors, carburetor, production of gasoline, combustion, electric motors and generators, voltage regulators, automatic chokes, and rapid test method.

**Automobile Operation and Maintenance** (Castle, made by USOE, 3 sets, 19 filmstrips, si, manuals). Designed for use in conjunction with motion pictures of the same titles, but may be used independently, particularly for review purposes or as discussion guides. Each filmstrip reviews the material shown in the motion picture, presenting pictorial frames with questions and discussion problems for class participation. Individual titles are listed below with indications of subject matter included.



### Automobile Operation (5 strips).

**Know Your Car** (No. OE 486). Construction of chassis; how engine converts gasoline into power; function of various units of automobile; meaning of gauges on instrument panel.



From filmstrip "Skill Behind the Man." (Fruehauf Trailer Co.)

**Your Driving Habits** (No. OE 487). Elements of good driving: starting the engine, use of clutch, gear shifting, use of brakes; driving on curves, pavements, and hills, through ice, snow, water, and mud; how to park a car.

**Keeping Your Car Fit** (No. OE 488). Need of weekly checkup; criss-crossing tires, regular lubrication, and oil change; replacing oil-filter element, periodic checkup of cooling system.

**The Periodic Checkup** (No. OE 489). Necessary steps in the periodic checkup of a car.

**Trouble Shooting Your Car** (No. OE 490). What driver can do to locate and correct minor car troubles; step-by-step procedure in checking why car won't start; how to recognize symptoms of impending trouble.

**Automobile Maintenance** (9 filmstrips). Review and discussion material on procedures in checking, servicing, and testing the units indicated by the individual titles.

**Introduction to Preventive Maintenance** (No. OE 461).

**The Battery, Ignition and Electrical System** (No. OE 462).

**The Engine Assembly** (No. OE 463).

**The Cooling System and Fuel System** (No. OE 464).

**Engine Tests and Tune-up** (No. OE 465).

**The Clutch and Hand Brake** (No. OE 482).

**The Hydraulic System** (No. OE 483).

**Steering, Wheels, Front and Rear Axles** (No. OE 484).

**Transmission, Drive Shaft, and Differential** (No. OE 485).

**Bus Operation** (5 filmstrips).

**The Operator and His Job** (No. OE 491). Three prime responsibilities of the bus operator. Typical situations illustrating each: safety and comfort of passengers; maintenance of schedules; courteous, helpful attitude toward passengers.

**The Operator and His Passengers** (No. OE 492). Importance of good customer relations; typical situations pointing out ways of handling problems.

**The Operator and Safety** (No. OE 493). Importance of safety in bus operation; safety checks to be made; procedures in safe operation.

**School Bus Operation, Part I: Bus Care and Maintenance** (No. OE 494). Daily and weekly maintenance checks; importance of safe driving habits.

**School Bus Operation, Part II: Passengers, Driving Hazards, Safety** (No. OE 495). Emphasizes driver's responsibility for safety of passengers; typical situations illustrating safe driving habits and handling of driving hazards.

**Care and Repair of Passenger Cars and Trucks** (Jam Handy, 5 kits, 35 filmstrips, si). These filmstrips are all concerned with Chevrolet cars and trucks, 1934 through 1941 models, showing procedures in repair and maintenance. Pictorial material includes photographs, cutaways, diagrams, and charts with lengthy captions on some of the frames. The diagrams and charts are suitable also for rapid blackboard reproduction. Individual titles are listed below with brief indication of subject matter content.

**Kit A—Servicing the Engine Assembly** (7 filmstrips).

**Engine Tune-up** (No. A-1, 57 frames). Tune-up instructions for all Chevrolet engines, 1934–1941, including compression test, checking spark



plugs, battery, distributor, coil and condenser, fuel pump, air cleaner, carburetor, starting-speed adjustment, manifold heat valve, ignition timing, valve adjustment, idling adjustment, cooling system, generator regulator.

**The Engine** (No. A-2, 57 frames). Major service operations including main-bearing adjustment, piston fitting, piston-ring fitting, piston-pin fitting, connecting-rod alignment, installing pistons, connecting-rod-bearing adjustment, and oiling system.

**Down-draft Carburetor** (Part I, No. A-3, 63 frames). Assembling instructions, downdraft carburetors.

**Down-draft Carburetor** (Part II, No. A-4, 49 frames). Repair methods in correcting carburetor troubles.

**The Up-Draft Carburetor** (No. A-5, 41 frames). Disassembly, reassembly, and adjustment of updraft carburetor for cab-over-engine trucks.

**Modern Valve Reconditioning** (No. A-6, 57 frames). Instructions for valve grinding, valve-seat refacing, valve-guide service and reassembly.

**The Cooling System** (No. A-7, 43 frames). Cleaning and reverse flushing; reconditioning of cooling system.

**Kit B—Servicing the Power Transmission Units (8 filmstrips).**

**The Synchro-mesh Transmission** (No. B-1, 127 frames). Synchro-mesh transmission mechanism; steps in disassembly, checking for repair, assembly, methods of inspecting and performing repairs.

**The 4-Speed Transmission** (No. B-2, 73 frames). Mechanism; steps in disassembly, inspection, methods of repair, reassembly.

**The Clutch** (Part I, No. B-3, 55 frames). Preliminary inspection and adjustments; overhaul of conventional Chevrolet clutch, 1934-1937.

**The Clutch** (Part II, No. B-4, 46 frames). Removal, disassembly, inspection, and reassembly of diaphragm-spring clutch, Chevrolet 1938-1941.

**The Hypoid Rear Axle** (No. B-5, 124 frames). Overhauling instructions for both passenger car and truck hypoid rear axles.

**Full-floating Rear Axle** (Part I, No. B-6, 39 frames). Axle-shaft replacement; rear-wheel bearing replacement.

**Full-floating Rear Axle** (Part II, No. B-7, 56 frames). Third member assembly overhaul, including propeller shaft, universal joint, ring gear, pinion, and differential assembly.

**The 2-Speed Rear Axle** (No. B-8, 85 frames). Disassembly, inspection, reassembly, and adjustment.

**Kit C—Servicing the Mobility Factors (11 filmstrips).**

**Knee-action, Part I** (No. C-1, 31 frames). Removal and replacement of Dubonnet type knee-action unit used prior to 1939.

**Knee-action, Part II** (No. C-2, 61 frames). Disassembly and reassembly of unit itself after removal from car. (Prior to 1939.)

**Knee-action, Part III** (No. C-3, 58 frames). Disassembly, inspection, repair, and reassembly of 1939-1941 knee-action unit—not Dubonnet type.

**Hydraulic Brakes** (No. C-4, 131 frames). Bleeding the brake system, adjustment, brake-shoe replacement, main cylinder overhaul, wheel cylinder overhaul, replacing hose, pipes, connectors, and cables.

**Vacuum Power Brakes** (No. C-5, 43 frames). Maintenance and adjustment.

**Shock Absorbers** (No. C-6, 58 frames). General service; repair instructions for both single and double-acting shock absorbers, 1936-1938.

**The Steering Gear** (No. C-7, 116 frames). Removal, disassembly, inspection, reassembly, and adjustment of worm and straddle-mounted sector type of steering gear. Parts and arrangement of mechanism.

**Wheel Alignment—Conventional Axles** (No. C-8, 60 frames). Front end and wheel alignment for conventional axles.

**Wheel Alignment—Dubonnet Type Knee Action** (No. C-9, 54 frames). Front end and wheel alignment instructions for Dubonnet-type knee-action units.

**Wheel Alignment—Knee Action** (No. C-10, 48 frames). Front end and wheel alignment for 1939 knee-action units (not Dubonnet type). Also information on 1940 and 1941 units.

**Wheel Balancing** (No. C-11, 58 frames). Instructions for both static and dynamic wheel balancing.

**Kit D—Servicing the Electrical System** (3 filmstrips).

**The Wiring System** (No. D-1, 55 frames). Diagrams of electric system units. Procedures in checking to determine location of trouble in wiring system (not including ignition).

**The Ignition System** (No. D-2, 65 frames). Checking of each unit of ignition system to locate trouble spots.

**The Generator Regulator** (No. D-3, 77 frames). Checks and adjustments on 1940-1941 generator regulator.

**Kit E—General Service and Sheet Metal Repair** (6 filmstrips).

**The Vacuum Gearshift** (No. E-1, 150 frames). Repair, adjustment, and maintenance of vacuum-gearshift unit.

**Cab-over-engine Trucks** (No. E-2, 68 frames). Instructions covering changes in service procedure due to unconventional design of cab-over-engine trucks.



**Metal Bumping and Hot Shrinkage** (No. E-3, 54 frames). Fundamentals of bumping sheet metal and in hot shrinking of stretched sheet metal.

**Major Body Repairs** (No. E-4, 86 frames). Measuring damaged body to square it up, roughing-out inner framework, further roughing-out, finish bumping operations.

**Turret Tops, Part I, Repair** (No. E-5, 63 frames). Procedure for repairing damaged turret tops.

**Turret Tops, Part II, Replacement** (No. E-6, 136 frames). Procedure for replacing turret tops damaged beyond repair.

**Elements of the Automobile** (Eye Gate, 12 strips, si). The automotive mechanisms shown in this series are those in use about 15 years ago. Diagrams and photographs of various parts of each system indicated in the individual titles (listed below) with some information on principles and operation.

**Steering Gear and Running Gear**

**The Differential**

**The Engine, Part I**

**The Engine, Part II**

**The Engine, Part III**

**Fuel System and Cooling System**

**Ignition, Part I**

**Ignition, Part II**

**Ignition, Part III**

**The Transmission**

**The Clutch and the Brakes**

**Tractor-trailer Operation** (Fruehauf, 2 filmstrips, sd, 20 min, booklet reproduction, loan). Instruction for drivers of tractor-trailer units, combining photographs, diagrams, and charts with recorded lecture. The material is well organized and clearly presented with good visualization. The booklets contain reproductions of the frames of each filmstrip, with the recorded lecture appearing in type. The two filmstrips are described below.

**The Man Behind the Wheel.** Designed to assist new drivers in learning fundamentals of driving a tractor-trailer unit. Seven fundamentals of efficient trailer operation explained and demonstrated: (1) equipment check, (2) coupling procedure, (3) double clutching, (4) braking, (5) forward turns, (6) backing, (7) uncoupling. Also contains data on double dumping, switch-backs, desert driving, close quarters, bad roads, rough going. Emphasis on safety.

**The Skill Behind the Man.** Sequel to "The Man Behind the Wheel," stressing responsibility and importance of driver, presenting various tricks and skill knacks. Reviews basic fundamentals, rules of the road, knowledge of governmental regulations and company regulations. Presents seven loading precautions in detail; methods of control on the road; importance of skill for safety; fundamentals of proper braking and gearshift procedures in various situations; skills such as handling skids, getting on and off shoulder, correcting load shifts, what to do if brakes don't work or blowout occurs; preventive maintenance and preventive driving.

**Units of the Automobile** (Jam Handy, 5 groups, 35 filmstrips, si). Basic information on the mechanical principles and operation of the automobile, consisting of photographs, drawings, cutaways, and charts with explanatory captions and text frames. Some of the strips are long for use in one class session and the text frames and captions tend to be lengthy. Quality of organization and treatment for class uses varies, with that of "The Carburetor" and "Electricity and the Storage Battery" (Parts I and II) among the best in the series. Individual titles with indications of subject matter content are listed below.

**Kit A—Fundamentals of Internal Combustion Gasoline Engine** (8 filmstrips).

**The Four-stroke Cycle Internal Combustion Engine** (Part I, No. A-1, 42 frames). Construction, operation, and principles of the four-stroke internal-combustion engine. Parts and their relationship—cylinder, flywheel, crankshaft, connection rods, manifold, piston. Four-stroke principle explained.

**The Four-stroke Cycle Internal Combustion Engine** (Part II, No. A-2, 71 frames). Continuation of Part I; valve mechanisms, crankshaft, mechanical timing, differences in basic cylinder-head designs, purpose of spark plugs; necessity for cooling and lubrication.

**Multiple Cylinder Engines** (No. A-3, 48 frames). Principles applied to engines of more than one cylinder; some refinements of the modern engine; types of firing order; how staggering is accomplished.

**The Carburetor** (No. A-4, 146 frames). Basic principle involved in carburetion, including atomization and vaporization. Air-fuel ratio; designs and devices used in carburetors; construction and principles presented in step-by-step development of simple carburetor designs.

**Fuel Feed Systems** (No. A-5, 56 frames). Parts, purposes, and operation of gravity-feed system, pressure-feed system, vacuum-feed system, pump system.



**The Ignition System** (No. A-6, 70 frames). Construction and operation of coil, condenser, breaker points, distributor, spark plugs. Principles of electromagnetic induction as applied to the engine system.

**Engine Lubricating Systems** (No. A-7, 63 frames). Principle of friction and reasons for lubrication. Types of lubricant and action of lubricants. Explains splash, pressure, combinations, and refinements. Parts and purposes of lubrication systems; method of cooling oil; use of filters.

**The Cooling System** (No. A-8, 73 frames). Necessity for cooling system. Basic principles. Construction and operation of thermo-syphon systems, pump systems, by-passes, and thermostats.

**Kit B—Principles of Power Transmission** (6 filmstrips).

**Mechanical Linkage** (No. B-1, 53 frames). Simple basic forms of machines; simple forms of mechanical linkage. Includes levers, gears, eccentrics, cogs, etc. Meaning and significance of mechanical advantage.

**The Clutch** (No. B-2, 55 frames). Purpose of clutch; principle of operation of two basic types—cone and friction disk.

**The Transmission** (No. B-3, 60 frames). Purpose of transmission; principle of gears and of simple selective gear transmission. Principles and construction of parts; principles of overdrive, gear control, standard shift, steering-column shift.

**The Differential** (No. B-4, 39 frames). Purpose and need for differential mechanism. Principles of operation.

**Completing the Transmission of Power** (No. B-5, 38 frames). Review of path of power in automobile engine. Explanation of propeller shafts, universal joints, Hotchkiss drive, torque-tube drive, single- and double-chain drive.

**Rear Axles** (No. B-6, 47 frames). Principles involved in semifloating, three-quarter floating, and full-floating rear axles. Dead axles and live axles.

**Kit C—Mobility Factors** (10 filmstrips).

**Bearings** (No. C-1, 55 frames). Fundamental differences in various types of ball and roller antifriction bearings. Importance and purpose of bearings. Classifications. Lubrication.

**Wheels, Rims and Tires** (No. C-2, 63 frames). Purpose, construction, and general types of wheels, rims, and tires.

**Brake Drums and Shoes** (No. C-3, 77 frames). Fundamentals of shoes and drum braking systems, self-energizing principles, lining, heat dispersion. Principles of friction as applied to passenger cars and trucks; the three things governing amount of friction developed. A brief history of brake development.

**Brake Operating Linkage** (No. C-4, 46 frames). Construction and operation of mechanically operated brake from foot or hand control to shoes. Mechanical linkage involved. How all four brakes are applied at some instance and with same force.

**Hydraulic Brakes** (No. C-5, 62 frames). Hydraulic principle; its use in actuating brake shoes; construction and operation of a simple hydraulic system.

**Power Brakes** (No. C-6, 86 frames). Factors affecting amount of braking action needed and sources of energy available. Principles, construction, and operation of compressed-air and vacuum-type brakes.

**Springs** (No. C-7, 91 frames). Importance of elasticity in action of springs; principles of spring suspension; types of springs.

**Shock Absorbers** (No. C-8, 50 frames). Purpose of shock absorbers; diagrams explaining principles of operation; types and their uses.

**Front Axles and Steering Gear** (No. C-9, 70 frames). Explanation of Elliot, reverse Elliot, and Lemoine axle ends. Basic steering-gear linkage. Types of worm-gear applications.

**Wheel Alignment and Balance** (No. C-10, 110 frames). Principles governing wheel alignment and front-end angles; principles of static and dynamic wheel balance. Importance of proper wheel balance.

**Kit D—Electrical System** (6 filmstrips).

**Electricity and the Storage Battery** (Part I, No. D-1, 95 frames). Fundamental aspects of electricity; principles of simple primary and secondary cells; Ohm's law; series and parallel connections; measuring volts, ohms, and amperes. Uses water analogy.

**Electricity and the Storage Battery** (Part II, No. D-2, 68 frames). Construction and principles of storage battery of secondary cells. Charging, specific gravity, testing batteries by standard tests. Uses of batteries.

**The Generator** (No. D-3, 108 frames). Review of electromagnetic principles. General principles, construction, and purposes of the generator.

**Current and Voltage Regulation** (No. D-4, 103 frames). Necessity for generator regulation. Explanation of third-brush and external-current regulation; external voltage regulation. Review of batteries, generators, and regulators.

**The Starting Motor** (No. D-5, 87 frames). General principles, construction, and operation. Bendix drive, mechanical shift, and solenoid applications.

**Chassis Electrical Systems** (No. D-6, 44 frames). Typical passenger-car wiring system. Operation and purpose of fuse; various circuits in wiring



system; suggestions on handling car wiring, including location of trouble, use of test panel, types of wire.

**Kit E—General Service** (5 filmstrips).

**Ignition Trouble** (No. E-1, 116 frames). Rule-of-thumb checks for road trouble; preventive maintenance checks with ignition-testing instruments.

**Engine Tune-up** (Part I, No. E-2, 64 frames). Importance of engine tune-up. General outline of procedure which can be followed in tune-up: uses of vacuum gauge and compression gauge; exhaust-gas analyzer; road test; preliminary tests; ignition system, battery, spark plugs, cables, distributor, coil and fuel-system tests. Use of manufacturers standards indicated.

**Engine Tune-up** (Part II, No. E-3, 80 frames). Procedure in Part I continued: carburetor, cooling system, cylinder heads, generator, valve timing and clearance, starting motor, ignition timing, etc. Final road test.

**Power Transmission Trouble** (No. E-4, 68 frames). Common sources of trouble in clutch, transmission, universal joints, propeller shafts, rear-axle assembly. Need for preventive maintenance.

**Safety Factors** (No. E-5, 77 frames). Importance of preventive maintenance and checks on brakes, steering gear, horn, lights, windshield wiper, wheel alignment. Stresses careful driving as greatest safety factor.

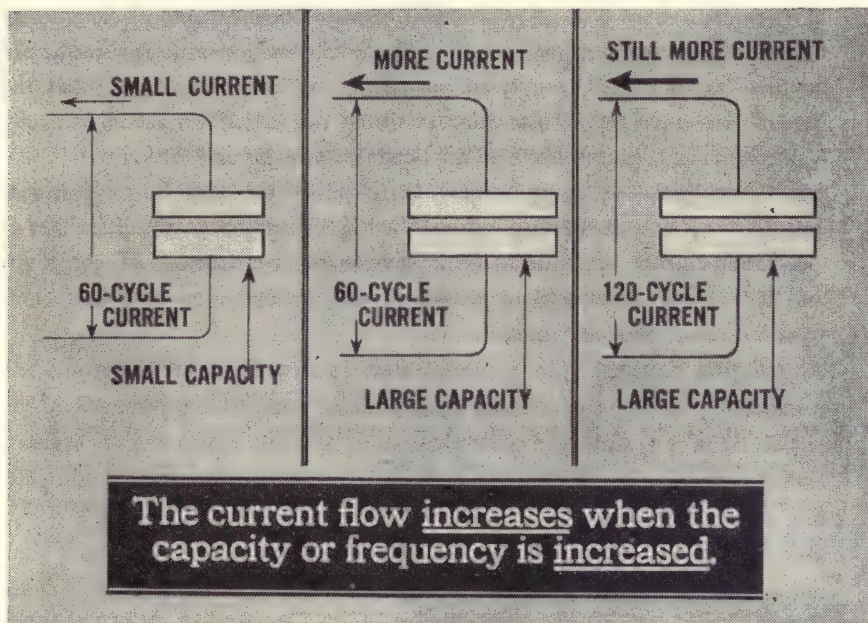
## BASIC ELECTRICITY

**Basic Electricity** (Jam Handy, 12 films, si). The basic principles of electricity fundamental to electrical-shop work and applications in industry. Some of the individual strips, such as those dealing with motors and storage batteries, are based on instructional and maintenance manuals prepared by manufacturers of such products, providing good diagrammatic material on actual devices. The illustrations consist of drawings, photographs, and diagrams, accompanied by captions and text frames. While the series is most specifically adapted to the needs of electrical shop courses, selected strips may be found of interest in physics, general science, and chemistry; particularly where it is desirable to demonstrate applications of principles and theory. The diagrams presented are suitable for rapid black-board reproduction. Individual titles with brief descriptions are listed below.

**Magnetism** (No. 1, 61 frames). General properties and laws of magnets; magnetic effects. Includes early compasses and early superstitions; effect of earth's magnetism on compasses, variation, the agonic line; natural and artificial magnets; materials which can be magnetized, diamagnetic materials; magnetic poles; molecular theory of magnetism, magnetic field; attraction and

repulsion, magnetic induction, retentivity and permeability; residual magnetism; magnetizing and demagnetizing bar, U and ring magnets.

**Static Electricity** (No. 2, 73 frames). Electron theory of positive and negative charges. Includes definition; review of composition of matter; transfer of electrons; laws of attraction and repulsion; induction; conduction; charging tem-



From "Basic Electricity Series." (*Jam Handy*.)

porarily and permanently; use of electroscope, condensers, Leyden jar, Van de Graaf generator.

**Current Electricity** (No. 3, 74 frames). Laws of current flow in various types of circuits. Includes water analogy; flow of electrons and direction of flow; effect of pressure, increased and decreased resistance, pressure drop; use of battery, conductors, two conductors; series and parallel circuits; Kirchhoff's laws and Ohm's law.

**The Electric Cell** (No. 4, 50 frames). Change of chemical energy into electrical energy; primary and secondary cells. Includes discoveries by Galvani and Volta; voltaic pile and first battery; action in voltaic cell; construction and operation of simple cells; defects of simple cells. Dry-cell—construction and operations, principles, disadvantages. Secondary cell—construction and principles.



**The Storage Battery** (No. 5, 83 frames). Construction and use of commercial storage battery. Includes construction and principles of Edison cell; methods of connecting cells in series; construction of parallel series batteries; methods of increasing capacity; construction of three-cell battery; charging, specific gravity, rating battery capacity; standard tests for automotive batteries; types of batteries for varying uses; uses of storage batteries.

**Electromagnetism** (No. 6, 55 frames). Construction and use of electromagnet; effects of electromagnetic field. Includes the magnetic field, direction of magnetic force; effect of loops; finding polarity of coil; use of cores; types and uses of electromagnets, construction of lifting magnets, electric bell, solenoid; induced current, Lenz's law and applications, polarity and direction.

**The Generator** (No. 7, 77 frames). Principles of the generator; types; generating direct and alternating current. Includes diagrams of the principles of alternating-current and direct-current generation; construction of generators and operation of parts; uses of generators; cycle of operation; two- and three-phase currents; polyphase motors.

**Alternating Current** (No. 8, 90 frames). Inductance, capacitance, and impedance in a circuit; transformers and rectifiers. Includes comparison with direct current; two- and three-phase generators, resulting emf; effects of increase and decrease of current strength; the henry; use of condenser; use and operation of transformers.

**Electric Motors** (No. 9, 66 frames). Principles of the motor; direct- and alternating-current motors; universal motors. Includes diagrams of simple motor showing operation of each part and principles involved; methods of increasing power; shunt wound, series-wound and compound motors for direct current; alternating-current motor construction; improving power factor; universal, commutator, and induction motors; use of centrifugal switch in split-phase motor; synchronous motor; use of starting devices.

**Electric Meters** (No. 10, 83 frames). Construction and operation of various types of meters for electrical use. Includes D'Arsonval galvanometer; direct-current ammeters and voltmeters; alternating-current ammeters and voltmeters; Wheatstone's bridge; movable iron vane, inclined coil, solenoid, and rectifier types.

**Applications** (Part I, No. 11, 60 frames). Heating—by resistance, special resistance coil, air gap between electrodes, induction—examples of each. Light—filament, electric arc, current through gas or neon, vapor and fluorescent lamps.

**Applications** (Part II, No. 12, 56 frames). Solenoids, motor uses, radio, electroplating, X ray, photoelectric cell, atom smashers, and other special uses.

**Common Types of Fractional Horsepower Single-phase Induction Motors** (Nasco No. SF. 114, si, 110 frames). Information concerning parts, construction, theory, purpose, and uses, testing methods, connections, and starting torques of split-phase, capacitor-start, and repulsion-start induction motors. Detailed discussion of each type. The strip is long but can be shown in sequences if desired; each of the three types of motors is presented in a separate sequence. Pictorial material consists of photographs and diagrams. The captions used tend to be lengthy. Although designed for agricultural users of electric motors, the strip is suitable for any electrical course studying this particular topic.

For supplementary and related materials see also *Electricity and Electrical Measurements and Measuring Electrical Units*.

## ELECTRICAL WORK

**Electrical Wiring** (Nasco, 4 filmstrips, si, double frame). Produced specifically for farm shop classes, but these filmstrips are applicable to any beginning classes in electrical work. The strips are long, containing photographs, diagrams, and text material. However, they are so organized that selected frames or sequences can be shown as required by class needs. Individual titles with descriptions follow:

**Electrical Wiring and Diagramming** (No. SF.112, 85 frames). Principles and diagrams useful in wiring; stresses need for ability to make and follow wiring diagrams. Diagrams and explanations of simple circuit, generator, ground wire, insulation, series and parallels, pull receptacles, switches, locations for different types of switches, duplex receptacles, combination switch and receptacle, three-way switches, connecting four-way switches. Symbols used; methods of diagramming circuits and connections.

**Identification of Electrical Units** (No. SF.110, 63 frames). Opens with sequences on desirability for consumers and purchasers to know electrical units. Photographs and descriptions of switches—types, purposes and applications of single-pole, three-way, four-way, toggle, snap. Outlet and switch boxes: uses, purposes, materials, sizes, shapes, and variations. Conductors and cable: types, uses, materials, size, how to determine size required. Conduit—purposes and uses. Receptacles, types—pull, duplex, and keyless—materials, purposes, uses. Covers and rosettes: types and uses. Switch and receptacle plates: types and uses. Miscellaneous electrical units: pendant switches, plugs, fuses, entrance switch boxes, tools needed for electric-wiring work. Several frames for identification quizzes.



**Important Rulings Based on the 1947 National Electrical Code** (No. SF.113, 123 frames). Reasons for obeying rules of the code. Filmstrips designed for use in conjunction with study of code itself. Includes explanations of general wiring requirements; code rulings and interpretations, practical application of rules. Mainly tables, charts, and wiring diagrams.

**Some Skills in Electrical Wiring** (No. SF.111, 42 frames). Step-by-step procedures in removing insulation, splicing wires, fastening wires under binding screws, mounting boxes. Other skills presented more briefly: inserting wires in conduit; removing covers of brass shell sockets; removing knockouts; cutting conduit; reaming conduit; bending conduit; fastening rigid conduit to boxes; fastening cable in box; ganging switch boxes; attaching fixtures; sinking ground rod. Stresses precautions and safety; need for wiring to meet standards. Consists of close-ups of work with text explanation on same frame.

Good practical demonstrations of basic skills.

**Electrical Work** (Castle, made by USOE, 4 groups, 28 filmstrips, si, manuals). Designed for use in conjunction with motion pictures of the same titles, but may be used independently for review purposes or as discussion guides. The strips review the information presented in the motion pictures through photographs and diagrams with question or problem captions with some statements of specific important points. Individual titles with indications of subject matter reviewed are listed below.

**Wiring (13 filmstrips).**

**Joining Solid Conductors** (No. OE 369). Removing insulation from wiring; cleaning conductor; making a western union, pigtail, plain tap, "wrapped tap," Britannia, loop tap, and fixture joints; use of blowtorch; fluxing and soldering joints; insulating joints with rubber tape and with friction tape.

**Soldering Lugs and Splicing Stranded Conductors** (No. OE 371). Soldering a lug, using electric soldering tongs; using blowtorch; using solder pot and ladle; splicing stranded conductors using a split, solder sleeve; making a served cable splice.

**Wire Sizes and Voltage Drop** (No. OE 372). Factors influencing ability of conductors to carry electron flow; measurement of wire sizes; wire area in circular mils; voltage drop; Ohm's law.

**Porcelain Protected Surface Wiring** (No. OE 376). Making an electric entrance to a building; need for providing fuse protection in circuit; installing wiring and porcelain fittings; supporting and insulating wires to meet National Electrical Code; preparing and connecting wires for service.

**Three-wire Service Entrance** (No. OE 374). Mounting and connecting out-door meter connection box; mounting and connecting service control box; grounding three-wire service entrance installation; installing concentric service entrance cable.

**Installing Surface Metal Raceway** (No. OE 380). Planning the job; using molding raceway fittings, installing molding raceway run to ceiling outlet; installing run from ceiling outlet to wall switch; installing run from ceiling outlet to wall fan; installing run to floor outlet.

**Roughing-in Nonmetallic Sheathed Cable** (No. OE 373). Planning installation of runs: circuit run, switch run, wall-receptacle run; determining location of required runs; installing offset bar hanger and ceiling outlet box; roughing-in circuit run, using nonmetallic sheathed cable; making up connections for switches, receptacles, and fixtures.

**Cable Surface Wiring** (No. OE 377). Making electrical entrance to building; need for providing fuse protection in circuit; installing non-metallic sheathed cable; handling and installing porcelain fittings; supporting and connecting cable to meet requirements of National Electrical Code; preparing and connecting wires for service.

**Preparing Old Buildings for Wiring** (No. OE 378). Planning wiring paths; visualizing obstructions; preparing paths for wiring runs.

**Wiring Old Buildings with Armored Cable** (No. OE 379). Steps in preparing building for wiring: installing ceiling outlet with plaster ring; installing outlet boxes; cutting and stripping armor from cable; attaching cable to outlet boxes; running armored cable; repairing openings in walls; joining conductors at ceiling outlet.

**Electrical Circuit Faults** (No. OE 375). Testing for and locating common circuit faults; testing for and locating grounds, resistance deterioration, interference in circuits.

**Installing Conduit** (No. OE 381). Planning job; bending electric metallic tubing; installing metallic tubing runs; bending rigid conduit; installing rigid conduit runs; using flexible conduit.

**Power Bending Conduit** (No. OE 382). Assembling and operating floor bender, and portable bender; making a 45-degree bend in 3-inch conduit; making offset in 1½-inch conduit; making offset in conduit already installed.

### **Motor Maintenance and Repair (6 filmstrips).**

**D.C. Motor, Part I: Mechanical Overhaul** (No. OE 392). Testing for electrical and mechanical faults; dismantling direct-current motor and recording data; how to turn commutator, clean and recondition parts,



repair, and replace field coils, assemble motor, adjust, and make final tests on motor.

**D.C. Motor, Part II: Rewinding** (No. OE 393). How to dismantle and clean armature core, determine commutator pitch, reinsulate core, insert coils, band an armature, shape coil ends, lay in and solder leads, balance armature, impregnate armature, and turn a commutator.

**Split-phase Motor—Rewinding** (No. OE 394). How to test split-phase motor for electrical and mechanical faults, record data necessary for accurate rewinding, dismantle and strip stator, rewind stator by hand or by using winding run, form and install skein windings, insulate, lace, dip, and bake stator, and assemble, lubricate, and test motor.

**Three-phase Motor, Part I: Preparing to Rewind** (No. OE 395). How to interpret and record name-plate data identify line leads and finish leads, draw a three-phase delta-connection diagram, indicate pole phase groups, number of poles, polarity of each phase group, remove coils and determine coil span; use coil-winding machine, and end-tape machine-wound coils.

**Three-phase Motor, Part II: Rewinding** (No. OE 396). How to insert mush coils, insert separators or "willies," fold, trim, and wedge slot insulation around windings, insert phase insulation, and make delta connection.

**Repulsion-induction Motor—General Overhaul** (No. OE 397). How to check for electrical and mechanical faults, dismantle, clean and plug commutator, turn commutator, remove damaged sleeve bearing, ream to size and install new sleeve bearing, remove damaged coil, wind and insulate new coil, and assemble and lubricate repulsion-induction motor.

#### **Electrical Machinery (5 filmstrips).**

**Single Phase and Polyphase Circuits** (No. OE 383). Explains single-phase synchronous generator; use of sine curves to illustrate flow changes; two-phase system and three-phase system; ways to simplify wiring in two-phase and three-phase systems.

**Rotating Magnetic Fields** (No. OE 384). Rotating magnetic field pattern; three-phase winding in demonstration stator; factors that cause rotation of magnetic field; construction of polyphase motors.

**Squirrel-cage Rotor Principles** (No. OE 385). Fundamental law of magnetism, of induced emf; electron flow in squirrel-cage rotor setting up magnetic poles which create torque; construction of squirrel-cage rotors.

**Split-phase Motor Principles** (No. OE 386). Construction of stator and rotor; comparison of winding in two-phase stator with split-phase stator;

effects of winding resistances and inductive reactances; use of capacitor to produce phase displacement.

**Repulsion Motor Principles** (No. OE 387). Construction of repulsion motor; rotor circuits and effect of brush position; short-circuiting and brush-lifting mechanism; application of repulsion motors.

**Motor Control** (4 filmstrips).

**Direct Current Controllers** (No. OE 388). Shunt motors and direct-current controllers in operation; direct-current faceplate controller connected to shunt motor.

**Across-the-line Starters** (No. OE 389). Theory and operation of manually operated thermal overload switch, magnetically operated across-the-line starter, drum reversing switch for three-phase motor, and magnetic reversing switch.

**Reduced Voltage Starters** (No. OE 390). Principle of transformer; operation of manual-starting compensator; thermal overload relay and automatic-starting compensator.

**Wound Rotor Controllers** (No. OE 391). Principles of wound rotor motor; operation of faceplate controller, drum-type nonreversing controller, drum-type reversing controller, and automatic magnetic starter for wound rotor motor.

For supplementary, illustrative, or related materials, see also the section on Basic Electricity and the following titles:

Aircraft Mechanic's Series

Soldering

Wiring for the Farm

Wiring Wisdom

Machine Shop Work Series

Soldering

Proper Care Means Longer Wear

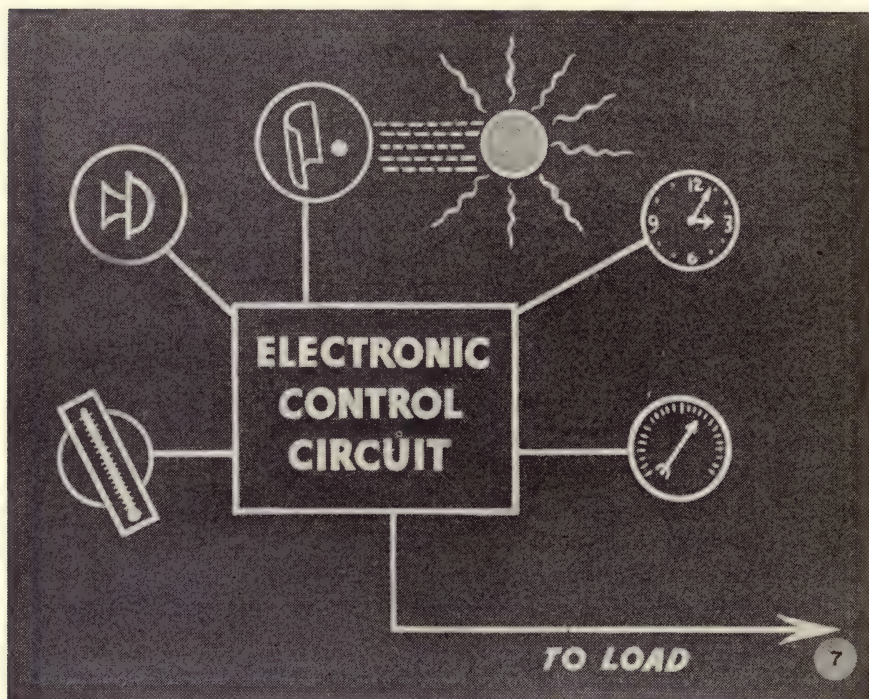
## ENGINEERING

**Audio Frequency Amplification** (Castle, made by U. S. Navy, No. SN-652, si, 25 frames). Describes theory and practice of amplification of the audio wave. Includes diagram of audio-frequency signal demodulated by detector tube; amplifying from coupling device; gains through transformers; types of trans-



formers, construction and current; effect of turns, ratio on amplification; amplification through vacuum-tube amplifiers; use of resistance coupler. Well organized; diagrams clear and simple to follow.

**Capacitive Reactance** (Castle, made by U. S. Navy, No. SN-648, si, 29 frames). Basic theory of capacitive reactance and its application to radio instruments.



From filmstrip series "Electronics at Work." (Westinghouse Corp.)

Includes typical condensers used in radio equipment; how condenser works; effect in circuit; increasing electron flow in alternating-current circuit; determining capacity of condenser by area of metal surfaces, space between plates, material occupying this space; increase in frequency; increase in capacity; decreasing resistance. Well organized; good schematic diagrams.

**Electronics at Work** (Westinghouse, 10 filmstrips, sd, about 15 to 30 min each). This course consists of 10 filmstrips with accompanying records, lesson books, instructor's manual and supplementary literature, explaining the basic principles and applications of electronics in industry. Each strip (designed for one lesson) contains one or more units—as indicated in the individual descriptions—presented

mainly by diagrams and drawings. Each unit ends with a review of principal points. Although designed primarily for industrial uses, this course is suitable for use in engineering classes and vocational school classes dealing with electronics and its applications. Since the material stresses applications, college physics and electricity classes may find parts of the course unsuited to their class requirements, although some of the basic information may be of interest. The vocabulary is well advanced and often technical in nature, and therefore, high school classes might encounter difficulties although parts of the basic information may be desirable for course needs. Individual strips are listed below with indications of content and running time of each unit.

**Lesson I (No. FS-601, 3 units, 30 min).**

**The Electron Theory** (42 frames, about 8 min). Conduction through vacuum and through gas tubes; electron theory of construction of matter; simple atom; coulomb measurement; simple structure of hydrogen atom, more complicated atom constructions; electron, proton, neutron, isotopes defined; concept of space shell; interatomic attraction; movements of free electrons outside orbits; movement in conductors and insulators.

**Electron Movement during Current Flow through Metal Conductors** (48 frames, about 8 min). Average drift of free electrons when potential is applied to terminals—drift explained and compared with electrical impulse—direction of movement, factors determining how many electrons pass a point per second. Applications of Ohm's law—effects of lengthened conductor, of cross-sectional area and conductor material—generation of heat for flow of electron; electrons breaking free from surface.

**Emission of Electrons and Their Controlled Flow Through Vacuum and Gases** (32 frames, about 12 min). How emission is accomplished; interatomic attraction compared with gravity; extra energy through added velocity permitting electrons to break loose; thermionic and photoelectric emission; high field emission; purposes of cathode and anode in tube, emission in tube; control methods; use of grid and nature of its controlling effect.

**Lesson II (No. FS-602, 2 units, about 15 min).**

**Theory of Current Rectification by Vacuum Tubes** (33 frames, about 8 min). Electron action in vacuum; purpose of cathode, of anode, role of vacuum; use in converting alternating current to direct current; movement as affected by rectifier, half-wave and full-wave rectification; effects of filter system and of capacitor; polyphase rectification, three-phase half-wave and full wave; methods and effects.



**Kenetrons** (22 frames, about 8 min). High-voltage low-current rectifiers—negative space charge and electron density at cathode. Need for high anode voltage; magnitude of voltage drop; purposes, construction, and operation of kenetrons; applications; suitability for high voltages.

**Lesson III** (No. FS-603, 2 units, about 15 min).

**How Gas in Tube Neutralizes Space Charge** (31 frames, about 8 min). Neutralization of space charge; need for neutralization; electron collision causing ionization; positive ion defined; how gas neutralizes space-charge electrons; starting potential and arc-drop potential; ionizing potential.

**Gaseous Rectifier Tubes** (40 frames, about 8 min). Construction and action in hot cathode tubes filled with argon—rectigon, the phanotron, tubes with mercury-pool cathodes, high short-time overload capacity and flexibility of control. Types of circuits and rectifiers.

**Lesson IV** (No. FS-604, 97 frames, 15 min).

**Electronic Amplification.** Presented by question-and-answer method. Kinds of tubes used for electronic amplification, construction, operation, typical circuits; meaning of “u” and what determines “u” of a tube; increasing amplification effect by functioning of more than one tube; class A, B, and C amplifiers explained; applications of electronic amplifiers.

**Lesson V** (No. FS-605, 85 frames, about 15 min).

**Electronic Generation of High-frequency Alternating Currents.** Basic theory of how vacuum-tube oscillators convert direct current to alternating current; basic theory of how oscillators are self-sustained at constant amplitudes; classification of oscillators by circuit types and by frequency range; applications of high-frequency oscillators to induction heating and dielectric heating.

**Lesson VI** (No. FS-606, 99 frames, about 15 min).

**Electronic Oscillators for Radio and Carrier Current Transmission.** Basic mechanism of radio broadcasting; generation, transmission, and reception of radio carrier waves; amplitude modulation, amplitude demodulation; frequency modulation and demodulation; applications of carrier current on power systems—voice communication, supervisory control, telemetering, load control, relaying.

**Lesson VII** (No. FS-607, 99 frames, about 15 min).

**Basic Circuits for Electronic Control.** Continuous grid control by pliotrons in direct-current circuits; typical circuits; thyratrons exercising continuous control only in alternating-current circuits; noncontinuous control, by hyratrons in direct-current circuits; how thyatron-rectified current can be controlled by phase shift; typical circuits and their operation.

**Lesson VIII** (No. FS-608, 74 frames, about 15 min).

**Industrial Applications of Electronic Regulation.** Typical distinction between regulation and control; explanation of regulator; electronic constant-voltage regulation; voltage indication antihunt amplification and power; electronic constant-speed regulation; electronic temperature regulation; summary of basic elements common to all regulator circuits.

**Lesson IX** (No. FS-609, 77 frames, about 15 min).

**Industrial Applications of Electronic Control.** Features of electronic motor drive; electronic controls keyed to passage of objects on conveyer line; electronic control keyed to defects in continuous strip under process; electronic controls keyed to time; summary of basic elements in all forms of electronic control; specific applications of each.

**Lesson X** (No. FS-610, 135 frames, about 20 min).

**Electronic Conversion of Light into Electricity and of Electricity into Light.** Light into electricity; photo tubes—barium, cesium, potassium, rubidium, sodium. Facsimile transmission; photometric measurement; color analysis; calibration of meters. Electricity into light—X-ray tube, fluoroscopy and radiography, cathode-ray tube, cathode-ray oscilloscope, television. Course summary.

**Fundamentals of Mechanics** (Castle, made by USOE, 7 filmstrips, si, manual). Designed for use in conjunction with motion pictures of the same titles, but may be used independently, particularly for review purposes or as discussion guides. The strips review the information presented in the motion pictures, using photographs and diagrams with question or problem captions and some statements of specific points of importance. Individual titles are listed below, with indications of subject matter reviewed.

**An Introduction to Vectors—Coplanar Concurrent Forces** (No. OE 361).

Meaning of scalar and vector quantities; how to add scalars and vectors; methods of vector composition and resolution; relationship between vector composition and resolution; between analytical and graphical methods of vector composition and resolution; how vectors may be employed to solve engineering problems.

**Principle of Moments** (No. OE 362). Concept of moment of a force; formula for finding its numerical value; meaning and significance of principle of moments; principle as applied to all coplanar force systems.

**Principles of Gearing—An Introduction** (No. OE 363). Friction gears and toothed gears—explanation and differentiation. Law of gearing, positive driving, generating involute profiles, pressure angle, generating cycloid profiles, velocity rates, circular pitch.



**Principles of Dry Friction** (No. OE 365). Friction defined; advantages and disadvantages of friction; forces involved; calculation of forces of static and kinetic friction and coefficients of static and kinetic friction.

**Principles of Refrigeration** (No. OE 360). Basic physics of heat transfer, refrigeration as method of heat transfer from inside of refrigerator to outside; compression and absorption systems.

**Principles of Lubrication** (No. OE 355). Why lubrication is necessary; physical properties of lubricants; lubricants in action; viscosity of lubricating fluids; basic lubricant requirements.

**Flue Gas Analysis (Orsat Apparatus)** (No. OE 367). How to set up Orsat gas analyzer; draw in air-free sample of flue gas; absorb and measure amounts of carbon dioxide, oxygen, and carbon monoxide in sample; calculate amount of nitrogen.

NOTE: See also "The Slide Rule (Multiplication and Division)" and "The Slide Rule (Percentage, Proportion, Squares and Square Roots)" listed and described in section on mathematics.

**Inductive Reactance** (Castle, made by U.S. Navy, No. SN-647, si, 32 frames). Basic theory of inductive reactance and its application in radio instruments. Includes review of resistance in direct current, magnetic fields around conductor, effect of coils, induced current, induced emf; inductance defined and compared with flywheel of engine; measurement in henrys, inductance value of coils, formula for computing inductance; inductive reactance explained, measurement in ohms, factors affecting value, formula for computing. Ends with summary. Well organized; explanations clear and in general well visualized.

**Le Tourneau Series** (Le Tourneau, 6 filmstrips, sd, 25-45 min each). Good material on operation and maintenance of various Le Tourneau power machines, suitable for use in vocational schools interested in such machinery or for industrial training purposes. Individual titles are listed below with descriptions of subject matter content.

**The Tractor Crane** (No. 43-51, 55 frames, 35 min). Operation and maintenance of tractor crane. Includes M20 tractor crane in use; diagrams and photographs indicating major structural units, parts, amount of leverage and lifting capacity; inspection and maintenance procedures for wheel assembly, boom, tongue, and sheave structural units; lubrication; operational procedures showing correct and incorrect positions, securing of load, traveling empty, lifting heavy loads; avoiding rough ground, centering hook; keeping power unit adjusted; etc. Operational sequence particularly good, giving precautions, positions, and proper procedures.

**The Carryall Scraper** (No. 46-33, 124 frames, 30 min). Operation and maintenance of carryall scraper. Opens with introduction to machine, followed by diagrams of major structural units. Proper operational procedure in hauling, loading, and spreading. Operating parts and their purposes, showing proper positions and adjustment. Second part is concerned with maintenance details, adjusting units for various parts; cable adjustments; sheave-assembly alignment; replacing tail gate, tire maintenance and repair, lubrication, etc. May be presented as two separate units—one on operation, the other on maintenance.

**The Model D Tournapull** (No. 55-1, 91 frames, 30 min). Disassembly and assembly details. Opens with major structural units, parts of machine and operation of blade. Part I, Disassembly; procedures in proper disassembly, unit by unit. Part II, Assembly; procedure in reassembly unit by unit. Mainly close-up photographs of assemblies and parts. Uses letter labeling in pictorial material (other filmstrips in series use names of parts); names of parts indicated in recorded sound.

**Le Tourneau Power Control Unit—Models "R" and "T"** (79 frames, 25 min). Training film in story form showing Bill, an operator, learning to use instruction book in proper maintenance of power control unit. Includes brake adjustment, clutch adjustment, cable-bearing adjustments, main gear-bearing adjustment, linion-gear assembly, and Timken taper bearings. Details of each procedure shown. Trouble-shooting hints included in recorded sound. Story form adds some interest, but necessarily lengthens the strip. Procedures not so clearly shown as in other strips of series.

**Safe Earthmoving** (No. 45-63, 36 frames, 30 min). Training film for operators of earth-moving machines, stressing safety, indicating safe and unsafe procedures, showing results of unsafe practices. Includes work and road condition hazards; procedures in stopping and leaving machine, going down hill, starting, working with helper, working where falling objects may strike machine or operator, use of safety bolts and cables, proper inspection and maintenance. Shows improper procedure, with caption concerning safety and line drawing showing results. Well organized; uses very good device for safety training, visualizing information effectively.

**The Super "C" Tournapull** (No. 6, 29 frames). Operation of the model "C" Tournapull. Photographs of machine in use on various types of jobs, showing position of machine and work for which it is used. Mainly introductory in scope; not as specifically operational training as other strips in group.

**Materials Testing** (Castle, made by USOE, 3 filmstrips, si, manuals). Designed for use in conjunction with motion pictures of the same titles, but may be used



independently, particularly for review purposes or as discussion guides. The strips review information presented in the motion pictures, using photographs and diagrams with question or problem captions, with some statements of important points. Individual titles are listed below with indications of subject matter reviewed.

**Tension Testing** (No. OE 348). Operation of hydraulic tension testing machine; how to prepare machine and specimen for test, conduct the test to determine specimen's elastic limit, yield point, and ultimate strength, and record and plot data to determine modulus of elasticity.

**X-ray Inspection** (No. OE 173). Use of radiographs in industry; generation of X rays in X-ray tube, wave nature of X rays; relation of voltage to wave length; relation of wave length to penetrative power; relation of exposure time to penetrative power, procedure in making radiographs; interpretation of radiographs for defects in metals.

**Measurement with Light Waves** (No. OE 174). Principles of measurement with light waves. Nature of light waves; reflection and refraction of monochromatic light by glass surface; cause of interference bands; use of these bands in ultraprecision measurement; translation into millionths of an inch.

Procedures in gauge-block inspection.

**Measuring Electrical Units** (Castle, made by U.S. Navy, 2 parts, No. SN-645a and No. SN-645b, si). Part I (54 frames). Making resistance, voltage, and current readings; ohmmeter, milliammeter, voltmeter; uses of meters and methods of adjusting resistance, voltage, and current.

Part II (38 frames). Procedures for testing condensers of various types with ohmmeter and capacity meter; measuring of alternating-current volts. Mainly concerned with use and care of electric instruments. Brief and specific, with clear explanations; well organized.

**Metallurgy** (Castle, made by USOE, 7 filmstrips, si, manuals). Designed for use in conjunction with motion pictures of the same titles, but may be used independently, particularly for review purposes or as discussion guides. The strips review information presented in the motion pictures, using photographs and diagrams with question or problem captions and some statements of important points. Individual titles are listed below with indications of subject matter reviewed.

**Heat Treatment of Steel—Elements of Hardening** (No. OE 170). How steel is quench hardened; how structures and hardness of steels with different carbon content change at progressive hardening stages; how lower and upper critical temperatures of steel are determined; how iron-carbon diagram is constructed and what it shows.

**Heat Treatment of Steel—Elements of Tempering, Normalizing, and Annealing** (No. OE 171). How steel is tempered; how structure, toughness, and hardness of plain carbon steel change at progressive stages in tempering; how steel is normalized by furnace heating and subsequent cooling in still air; how normalizing breaks up undesirable coarse grains and homogenizes the structure; how steel is annealed and how annealing relieves stresses in steel and softens it.

**Heat Treatment of Steel—Elements of Surface Hardening** (No. OE 172). How steel is pack carburized, gas carburized; how thin, hard case is obtained by cyaniding; how nitriding is used to obtain a very hard case; how steel is flame hardened and induction hardened.

**Heat Treatment of Aluminum** (Part II, No. OE 345). Nature of cold-working operations; crystalline structure of aluminum alloys; slip planes and deformation; microstructure changes during cold-working, during annealing; heat-treatment procedure; aging or precipitation hardening; effects on physical properties of aluminum.

**Heat Treatment of Aluminum** (Part II, No. OE 345). Nature of cold-working operations; crystalline structure of aluminum alloys; slip planes and deformation; microstructure changes during cold-working, during annealing; cold-working and annealing operations.

**Powder Metallurgy, Part I: Principles and Uses** (No. OE 346). Principles of powder metallurgy: powder, pressure, heat; five major industrial applications; laboratory process of combining silver and nickel powders; includes mixing powders, pressing mixture into briquette, heating or sintering.

**Powder Metallurgy, Part II: Manufacture of Porous Bronze Bearings** (No. OE 347). Manufacturing processes by which metal powders are fabricated into porous bronze bearings and impregnated with oil; how particles are welded together in pressing and sintering; how interconnecting pores make self-lubricating bearing possible.

**Radio and Electronic Symbols** (Visual Sciences, si, 39 frames). Line drawings of symbols, of devices indicated by symbols, abbreviations, and some brief text defining the device (generally all on one frame). Includes antenna, counterpoise, ground, inductor types, capacitor types, resistors, battery (one-cell and multicell), receiver, loud speaker, microphone, phonopickups, switches, receptacles, plugs, crystal and crystal detector, rectifier, lamps, neon bulb, tube components, tubes, protection fuse, meters, wires, terminals, vibrators, relays. Much information on each frame, reducing legibility.

**Radio Frequency Amplification** (Castle, made by U.S. Navy, No. SN-653, si, 18 frames). Theory and practice of amplification of detected radio wave.



Includes one-tube detector circuit diagramed, showing audio-frequency signal; need for amplification (particularly in aircraft-radio reception); deficiency of one-tube receiver, advantages of multistage receiver; building up signal strength and producing sharpening of tuning; improvement through use of several stages of amplification; critical tuning. Well organized; diagrams simple and clear; visualization in general good.

**Reproducers** (Castle, made by U.S. Navy, No. SN-654, si, 29 frames). Construction and operation of headphone and loud-speakers. Includes functions; electrical impulses set up by sounds reaching microphone, impulses as radio waves, reproduction of audio output; function of receiver; definition of reproducer; comparison with structure of human ear; principles of electromagnetism reviewed; applications of principle of electromagnetic attraction to radio reproducers; construction and operation of earphone, loud-speaker of magnetic type and dynamic type. In general, well organized, clear diagrams, good visualization, and clear explanations.

See also the following series and individual titles for supplementary, illustrative, or related materials:

Highway Research High Lights

Electronics

Test of Construction Materials

The Slide Rule

Aircraft Mechanics Series

Stresses in an Airplane

Aviation Metalsmiths Series

Properties of Metals, Parts I and II

Protection of Metals, Parts I and II

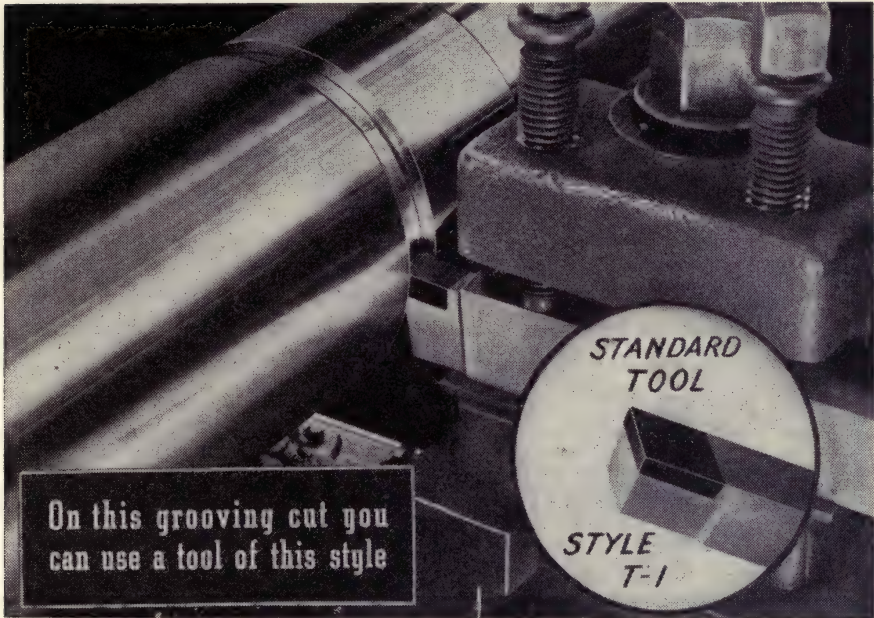
## MACHINE-SHOP PRACTICE

**Bench Work Series** (Jam Handy, 10 filmstrips, si). The fundamentals of benchwork demonstrating techniques in photographs and providing cross-sectional views and diagrams. The diagrams and cross sections are suitable for rapid blackboard reproduction. In general, the strips tend to be long and contain some lengthy text frames. The two strips on layout work may also interest mechanical drawing classes. Individual titles are listed below with brief descriptions.

**Hand Tools** (No. 1, 78 frames). Definition of benchwork and types of work included. General hints, such as keeping bench clean, tools clean and orderly,

and protecting work. Description of various hand tools, their use and care, including vise, hammer, cold chisel, files, screw drivers, wrenches, and pliers. Various types of each kind of tool. Some precautions.

**Hand and Power Hack Saws** (No. 2, 60 frames). Methods of sawing various metals. Selection of feeds and speeds for various metals on power saws.



From filmstrip "Designing Carbide Tools." (Carbide Co.)

Description of hand and power hack saws, function of parts, adjusting and setting up work.

**Drills and Drilling** (No. 3, 87 frames). Explains types of drilling. Parts of a drill and their functions. Drilling machine: parts, function, uses, operation. Techniques in drilling; methods of laying out and setting up work.

**Reaming, Tapping, and Treading** (No. 4, 86 frames). Types of reamers, taps, and dies and their parts. Techniques in use of each. Removing broken taps. Handling and construction of reamers, taps, and dies. Methods of threading.

**Finishing Rough Castings** (No. 5, 50 frames). Parts of casting to be removed. Detailed steps in finishing the casting. Tools used.

**Scraping** (No. 6, 69 frames). Scraping as a precision operation; reasons for its necessity. Tools used, care and purposes of each. Techniques of scraping:



flat scraper on flat work; scraping cylindrical surfaces; spotting. Methods of checking finished work.

**Rivets and Riveting** (No. 7, 76 frames). Definition of riveting; statement of its uses. Kinds of rivets, uses, rules for selection. Tools used. Methods of riveting. Types of joints. Causes of failure. Precautions.

**Layout Tools and Measuring Instruments** (No. 8, 79 frames). Importance of correct layout; definition of layout. Description and uses of tools, showing correct and incorrect methods, including scribes, steel rule, center punch, dividers, square, protractors, bench plate, surface gauges, level. Use and care of measuring instruments, including calipers, gauges, micrometer, verniers.

**Layout Work** (Part I, No. 9, 84 frames). Importance and purposes of layout. Basic principles and tools; techniques, basic geometric constructions. Procedures in layout work.

**Layout Work** (Part II, No. 10, 109 frames). Special layout problems on work examples, showing step-by-step procedure, tools, stock, and drawings, with emphasis on accuracy. Includes special wrench (62 frames), retainer base plate (30 frames), six stud holes around cylinder head (15 frames).

**Carboloy Training Films** (Carboloy, 6 filmstrips, si, instructor's manual and reference booklets). Filmstrips cover the fundamentals of carbide-tool manufacture, design, application, and maintenance. The material is in general well organized and clearly presented in photographs, diagrams, charts, and drawings with brief captions and some short text frames. Each filmstrip is accompanied by a reference booklet that includes complete reproduction of the filmstrip; glossary of terms used; information such as tables of recommended cuts, feeds, and speeds; formulas; diagrams of tool-angle nomenclature; grinding-wheel specifications. Individual titles are listed below with brief descriptions.

**What Is Carboloy Cemented Carbide?** (No. 1, 60 frames, Booklet GT-145). Introductory film providing information on what cemented carbide is, physical characteristics, and how it is made. Includes development; basic ingredients of various grades; manufacturing processes—mixing, pressing, sintering, forming. Shaping methods—molding individual blanks, hand forming ingots into individual pieces, extruding. Quality controls; six basic physical properties; how properties are varied for different grades; applications in industrial jobs.

**Designing Carboloy Tools** (No. 2, 130 frames, Booklet GT-146). Review for tool designers of special requirements necessary when designing tools with carbide tips, emphasizing fact that design of tool depends on job. Includes importance of single-point tools; multiple-point tools as simultaneous application of number of single-point tools; factors influencing design; how to

determine size of shank, type of tool, tip proportions, tool shape, side-cutting edge angles, end-cutting edge angles, relief angles, rake angles, and nose radius; designing a tool for interrupted butts.

**Brazing Carboloy Tools** (No. 3, 85 frames, Booklet GT-147). Step-by-step procedure for torch brazing carbide blanks to steel shanks; brazing of single- and multiple-point tools; special method for renewing worn-out HSS cutters by brazing on carbide tips; removing tips. Includes both ordinary braze and sandwich-braze methods.

**Chip Breakers** (No. 4, 100 frames, Booklet GT-148). How to determine most efficient chip breakers for carbide-steel cutting tools; how to adjust to meet individual conditions; step-by-step procedure for grinding rapidly and accurately; data for maximum results on steel cutting. Need for chip breakers; overcoming problem of chip disposal. The ground-in step-type chip breaker. Characteristics of different chips; chip-breaker widths, depths, and angles commonly used; how to determine their dimensions. Overcoming common chip control difficulties.

**Grinding Carboloy Tools** (No. 5, 145 frames, Booklet GT-149). Step-by-step procedure for grinding single-point carbide tools. Covers grinding from brazed, damaged, and ordinary dulled states. How to hog off stock rapidly; how to finish accurately; recommended equipment, wheels, and accessories. Basic grinding requirements; three important grinding motions. Safety precautions. Use, care, and dressing of silicon carbide and diamond wheels.

**Putting Carboloy Tools to Work** (No. 6, 118 frames, 3 parts, Booklet GT-150). Important points to observe when applying carbide tools. Part I, "Putting Tool on Machine"; Part II, "The Machine"; Part III, "Trouble Shooting." Includes requirements for good work, adapting rocker-type holders to carbide-tool use; importance of minimum tool overhang; what to check before starting machine; importance of correct speeds, feeds, and depths of cut; determining and checking surface speed per minute; determining correct feed and depth of cut; use of coolants; what to check when tool dulls prematurely—cutting edge chips, tool chatters, chip does not break properly, and when finish of work is not satisfactory.

**Draw Bench Operations** (Castle, made by U.S. Navy, No. SN-258, si, 53 frames). Indicates purposes, parts, and operation of drawbench. Demonstrates procedures in making simple cap strip, including making of pattern and setting up. Clearly organized; operations well visualized.

**Engine Lathe Series** (Jam Handy, 11 filmstrips, si). This series begins with an introduction to lathes and lathe tools, followed by step-by-step procedures for various operations. The strips cover most common lathe operations, including



precautions in the descriptions of procedures. In general, presentation of procedures is well organized and clearly shown, with some very good close-up photographs showing details of work (a few photographs do not show the operations clearly). Each filmstrip presents considerable information, but is organized into units or lessons, which may be presented as needed by the class. Terms relating to lathes and lathe work are defined as they occur in discussions of procedures or operations. Captions and text are brief. Individual titles are listed below with descriptions.

**Kinds, Parts, Safety** (No. I, 84 frames). Lathe work—types of jobs done, kinds of lathes, main parts, major uses, setting of controls, changing work speed and tool feed. Operations—straight turning, turning, angular turning, taper, chamfering, facing, shoulder turning, rounding a turned edge, recessing, drilling, reaming, boring, etc., introduced. Safety factors—clothing, knowledge of machine and its operation, safe procedures, kinds of work that may cause eye injury, methods of avoiding injury. Review tests follow each sequence.

**Operating Speeds** (No. II, 76 frames). Starting, stopping, and reversing the lathe—procedures and precautions. Setting lathe speeds (underneath motor-driven lathe used in example). Estimating lathe speeds; use of tables, of speed indicator; problems. Reviews and tests for each sequence. Lathe controls indicated and labeled on various kinds of lathes.

**Carriage Controls: Feeds** (No. III, 81 frames). Operating carriage controls—parts and controls indicated, uses and operational procedures; use of compound rest; operation of both hand and power controls, precautions. Setting feeds, quick-change gear mechanism: step-by-step procedure for setting feeds, use of tables in estimating, use of plate, classification of feeds. Carriage and feed controls indicated and labeled on various types of lathes. Tests and review on each sequence.

**Turning Tools** (No. IV, 84 frames). Tool-bit designs—common tool-bit shapes and sizes; position in holder; operation of tool—front clearance, side rake and side clearance, back rake. Use of table to determine correct angles. Shape and angles of common cutting tools; proper grinding of bits for various types of jobs. Grinding lathe tool bits—safety precautions, step-by-step procedure, use of grinding gauge. Reviews and tests.

**Chucks: Chucking Work** (No. V, 96 frames). Kinds of lathe chucks—procedures and precautions in reversing and installing jaws. Three common types of lathe chucks, types of spindle noses; step-by-step procedure in installing and removing chucks. Step-by-step procedure in mounting work in three-jaw universal chuck (rough stock); four-jaw independent chuck (rough stock). Review, tests.

**Centers: Setting Tools: Facing** (No. VI, 88 frames). Lathe centers—installing and aligning. Live and dead centers; checking; removing live and dead centers; truing soft centers and hard centers; aligning with test bar and indicator, by cut and try method. Setting up lathe tools—kinds of tool holders, selecting proper tool holder, procedure in setting up tools, checking, precautions. Facing work in a chuck—procedure for this operation step by step. Review; tests.

**Center Holes, Mounting Work, Facing Between Centers** (No. VII, 77 frames). Drilling center holes—procedures step by step. Recommended sizes of center holes; drilling in chucked work; removing broken center drill; drilling with drill press or lathe. Mounting work between centers—types of lathe dogs and their uses. Step-by-step procedure in mounting work; checking setup. Facing work between centers—step-by-step procedure of setting up, facing operation, laying out length, recommended feeds. Reviews and tests.

**Turning between Centers: Shouldering** (No. VIII, 82 frames). Straight turning between centers—step-by-step procedure. Rough and finish-turning; precautions; checking; proper setup, feed, and speed. Turning a square shoulder—procedure, precautions. Turning a filleted shoulder—procedure. Turning a beveled shoulder—procedure. Reviews and tests.

**Recessing, Chamfering, Filing, Polishing, Knurling** (No. IX, 81 frames). Step-by-step procedure given for each, followed by review and test: turning a recess; chamfering; filing; polishing; knurling. Precautions and proper setups included.

**Taper Turning: Threading** (No. X, 89 frames). Step-by-step procedure for each of the following operations, with review and test on each: angular turning, taper turning with compound rest (methods of checking work included); offset tailstock method of taper turning (methods of measuring included); cutting external screw threads, national form.

**Collets, Faceplate, Rests** (No. XI, 88 frames). Step-by-step procedure for installing and removing draw-in collect attachment—chucking work. Installing and removing faceplate—mounting work. Lathe rests—kinds, uses of steady and follower rests. Location method of attaching and adjusting each. Reviews and tests.

**First Course in Mechanical Drawing** (SVE, si, 86 frames, manual). Includes tools, paper, use of tools; drawings of objects in several planes; alphabet of lines; several drawings in various stages of work; locating and dimensioning; layout for title block; upright letters and figures used; perspective drawings. Filmstrip consists of drawings; explanations and information are in the manual. Elementary, beginner's material, included in this section, since examples and types of drawings pertain more directly to machine-shop work than any other type of mechanical



drawing, although the strip is very general and nonspecific in treatment. Would require thorough previewing by instructor for adaptation to specific courses.

**Flush and Blind Riveting** (Castle, made by U.S. Navy, No. SN-298, si, 68 frames). Definition of flush and blind riveting. Methods of countersinking and dimpling. Selection of type of dimpling. How riveting is done. Tools used. Checking rivets. Precautions in blind riveting. In general, well organized and clearly presented.

**Form Blocks and Forming** (Castle, made by U.S. Navy, No. SN-1037, si, 67 frames). Procedures in shaping metal by use of form blocks. Use of dies for flanging, making hollows, and forming joggles. Description and uses of various types of form blocks. Importance of knowing how to make and use proper types of form blocks and dies. Well organized; operations clearly shown.

**Forming Outside and Inside Flanges** (Castle, made by U.S. Navy, No. SN-295, si, 50 frames). Step-by-step procedures in shrinking and stretching of inside and outside flanges on a single piece of metal. Includes making the form blocks, laying out station frames, and bending the flanges. Simple and clear instructions; well organized.

**Foundry Practice** (Castle, made by USOE, 3 groups, 14 filmstrips, si, manuals). Designed for use in conjunction with motion pictures of the same titles, but may be used independently, particularly for review purposes or as discussion guides. The strips review information presented in the motion pictures, using photographs and diagrams with question or problem captions and some statements of important points. Individual titles are listed below with brief indications of subject matter reviewed.

**Bench Molding (5 filmstrips).**

**Molding with a Loose Pattern** (No. OE 423). Identification and use of common bench molder's tools; how molding sand is prepared; how to face a pattern, ram and vent a mold, roll a drag, cut a sprue, runner, gates, and riser, swab, rap, and draw a pattern; what takes place inside a mold during pouring.

**Making a Simple Core** (No. OE 424). How to prepare a suitable sand for coremaking, make small cylindrical core in either one or two pieces, assemble two-piece core, locate vertical core in mold and provide necessary venting. How cores are baked. How core gases escape when mold is poured.

**Molding Part Having a Vertical Core** (No. OE 425). How to identify parts of pattern indicating how cores are to be placed, mold the drag and cope halves, mold a gate and riser instead of cutting them, draw a pattern

with "molder's touch," vent a mold to permit escape of core gases, locate vertical core in mold. How and why pouring basin is made.

**Molding with a Split Pattern** (No. OE 426). Why split patterns are used. How ramming affects permeability of sand in mold. How to mold the drag and cope, reinforce mold with nails, patch mold.

**Molding with Gated Pattern** (No. OE 427). What gated pattern is and why it is used. How match or follow board may simplify making a parting. How facing sand is prepared and used. How and why some patterns are rapped through the cope.

#### **Floor Molding (5 filmstrips).**

**Molding with a Loose Pattern** (No. OE 428). Distinction between bench and floor molding. How to locate pattern to facilitate making the parting, face deep pattern, ram a drag and walk it off, clamp mold, locate sprues and risers using spotters, tuck crossbars of large cope. Why crossbars are necessary in the cope.

**Molding Part with Deep Green Sand Core** (No. OE 429). Why to use follow board with thin, boxlike pattern. How to reinforce green sand core with nails, locate sprue and watch-up pins, use gagers, ram and vent green sand core.

**Molding a Valve Body** (No. OE 430). Use of split pattern and multi-part dry sand core. How nails are used to reinforce pockets and hanging bodies of sand. How to gate a mold for rapid, uniform distribution of clean metal, locate core and seal core prints. Purpose and use of runner box.

**Molding a Horizontal Cored Part** (No. OE 431). Use of horizontal core, of split pattern, of chaplets and chaplet supports. How to gate a mold for rapid pouring of thin casting and how to clean a casting.

**Molding with a Three-part Flask** (No. OE 432). How to use a deep follow board, use a check in a three-part flask. Purpose and method of step-gating; techniques of facing, ramming, and venting deep green sand core.

#### **Machine Molding (4 filmstrips).**

**Molding on a Jolt Squeeze Machine** (No. OE 433). Principles of jolt squeeze molding machine; nature of match plate. How to attach air vibrator, fit flask and match plate together, check the squeeze head clearance, fill drag and jolt it, roll the mold, fill cope and apply pressboard, squeeze mold, draw the pattern, finish and close the mold.

**Molding on a Jolt Roll-over Pattern Draw Machine** (No. OE 434). Principles of jolt roll-over pattern draw machine. How to place flask on



roll-over table, fill drag and jolt it, clamp flask to roll-over table, roll mold over, draw pattern, set drag and cope pattern plates on master moldboards, finish and close the mold.

**Preparing a Cupola for Charging** (No. OE 436). How to recognize end of a heat. Procedures for dropping bottom and for preparing a cupola for its next heat.

**Charging and Operating a Cupola** (No. OE 437). Purpose of essential parts of cupola. Important steps and precautions in firing, charging, and operating cupola. Cycle of operations involved in melting process.

**How to Develop an Intersection** (Castle, made by U. S. Navy, 2 parts, si).

**Part I: Making Flat Patterns** (No. SN-1036a, 70 frames). Procedures in making a true flat pattern for filler neck; 2-inch cylinder, 8 inches in length, one end elliptical and both ends flanged.

**Part II: Fabricating and Assembling the Parts** (No. SN-1036b, 49 frames). Step-by-step procedure in laying out, forming, and assembling filler neck and collar to end of metal tank, using machine and hand tools. Clear and simple instructions; well organized. May also interest mechanical drawing classes as supplementary materials (Part I).

**Introduction to Machining** (Jam Handy, 3 groups, 16 filmstrips, si). The fundamentals of machining and the basic principles of various machines. Photographs illustrate procedures and cross-sectional views or drawings magnify small parts or show inaccessible parts. Although some of the strips are long and text material tends to be lengthy, the organization and treatment is in general good. Individual titles are listed below with brief descriptions.

**Kit A** (4 filmstrips).

**The Machinist** (No. A-1, 50 frames). Brief history of machining from first crude tools to modern powered equipment. Importance of machine tools and position of machinist in modern industry. Necessity for specialization. Five main types of machinists and type of work done by each. Training required, and brief statement of opportunities. May also interest vocational guidance groups.

**Machine Tools** (No. A-2, 53 frames). Definition of machine tool and the four main purposes. Importance of precision feature of modern machine tools. Five main divisions of machine tools. General description of common machine tools and type of work done by each, including lathes, milling machine, planers, shapers, drill press, boring machine, and grinder. Brief summary of some specialized machines.

**Machine Technique** (Part I, No. A-3, 35 frames). Cutting tools and "tool steels." Requirements for tool materials. Types of tool steels and

their properties. Summary of more important types of tools used on the different machines.

**Machine Technique** (Part II, No. A-4, 62 frames). Explanation of feed and speed and their importance. Factors in establishing best cutting speed. General speed ranges. Determining speed in relation to various types of machines. Formulas given. Cooling and lubricating fluids: what they are, purposes, and uses.

**Kit B (2 filmstrips).**

**Measurements and Measuring** (Part I, No. B-1, 38 frames). Need for knowledge of measurement. International standard of measurement. Requirements for accuracy. Basic dimensions and limits. Tables of decimal and fractional measurements. The steel scale and its variations, dividers and calipers—types, uses, and care.

**Measurements and Measuring** (Part II, No. B-2, 57 frames). The micrometer—parts, uses, how to take measurements, how to read it, care and cautions in use. Vernier scale—uses, types, reading the scale, taking measurements, care of instruments. Gauges and gauge blocks—types, uses.

**NOTE:** These two filmstrips may also interest mechanical drawing or machine-shop mathematics classes.

**Kit C (10 filmstrips).**

**Drill Presses** (Part I, No. C-1, 47 frames). Common types of drill presses and the structural parts, purposes for which each type is used, including sensitive, bench, standard, plain radial, semiuniversal radial, universal radial, gang, and multiple-spindle. Three methods of holding drill in the press.

**Drill Presses** (Part II, No. C-2, 43 frames). Method of holding work in press. Seven major operations performed with drill press: drilling, reaming, boring, counterboring, countersinking, spot facing, and tapping.

**Grinding Machines** (No. C-3, 40 frames). Introduction to grinders; grinding wheels; parts and functions. What can be done with grinding wheels. Types of abrasives and wheels. Operations.

**Lathes** (Part I, No. C-4, 59 frames). Construction, parts, and function of the lathe. Methods of holding the work in the lathe. Type of work done by the lathe.

**Lathes** (Part II, No. C-5, 46 frames). Outlines operations performed on the lathe, including facing, straight turning, taper turning, drilling, boring, reaming, thread cutting, knurling. Care of lathes. Safety hints for lathe operators.



**Milling Machines** (No. C-6, 61 frames). Introduction to milling machine: what it is, construction, basic parts, basic cutter types, and the uses. Milling feeds and speeds. Types of mills. Operations performed on these machines; their use and function of parts.

**Shapers** (No. C-7, 42 frames). Introduction to shapers; basic parts and their functions. Shaper tools and their uses. Types of work performed by shapers. Safety hints.

**Planers** (No. C-8, 40 frames). Difference between shaper and planer. Construction features of planer. Purposes of various parts of planer. Types of work performed. Planer tools and their uses. Safety precautions.

**Specialized Machines** (Turret Lathes) (No. C-9, 31 frames). Description of turret lathe and types of work that can be done on it. Advantages of turret lathes in production. Automatic screw machine and its functions; both single spindle and multiple spindle. Relationship of turret lathes to lathe work.

**Other Specialized Machines** (No. C-10, 45 frames). Basic principles, work performed and functions of broachers, slotters, boring mills, profilers, and hobbers.

**Machine Shop Work** (Castle, made by USOE, 24 groups, 125 filmstrips, 11 manuals). Designed for use in conjunction with motion pictures of the same titles, but may be used independently, particularly for review purposes or as discussion guides. The strips review information presented in the motion pictures, using photographs and diagrams with question or problem captions and some statements of important points as summary or emphasis. Most of these films review specific machine-shop operations; however, some groups may be of interest in other classes, *i.e.*, "Blueprint Reading" may be useful as supplementary material in blueprinting classes and "Precision Measurement" may be of interest in industrial or vocational mathematics courses. Individual titles are listed below with brief descriptions where the title is not self-explanatory.

**Basic Machines** (4 filmstrips). Introductions to the basic machines, with information concerning type of work done on each, how workpiece is held or supported, feeds, and speeds.

**Basic Machines—the Lathe** (No. OE 68).

**Basic Machines—the Milling Machine** (No. OE 69).

**Basic Machines—the Shaper** (No. OE 70).

**Basic Machines—the Drill Press** (No. OE 71).

**Precision Measurements** (8 filmstrips).

**The Steel Rule** (No. OE 1). Reading steel rules; use of flexible hook and rule-type depth gauges and combination squares; use of inside and outside calipers to transfer dimensions to and from steel rule.

**The Micrometer** (No. OE 2). Various forms of micrometer—outside, inside, and depth micrometers. Correct reading of barrel and thimble scales. Use and care.

**Fixed Gages** (No. OE 3). Use of snap, plug, ring, thread, screw-plug and flush-pin gauges. Care to maintain accuracy.

**Verniers** (No. OE 4). Principles of vernier scale, applications to precision measuring instruments. Vernier calipers and micrometers—use and correct reading.

**Height Gages and Test Indicators** (No. OE 5). Fundamental principles of vernier height gauge, various forms of standard indicators. Demonstrations of uses.

**Precision Gage Blocks** (No. OE 49). Calculation of stack of gauge blocks; cleaning and assembling blocks; uses and proper storage.

**Gage Blocks and Accessories** (No. OE 246). Accessories used with gauge blocks; inspection for plug gauge, adjustable snap gauge, profile gauge, ring gauge, screw-thread gauge; building height gauge and scriber.

**The Bevel Protractor** (No. OE 50). Principles of vernier bevel protractor; setting and reading bevel protractor; use and proper care.

**Carbide Tools** (5 filmstrips). Procedures in preparation, use, and maintenance of carbide tools.

**Brazing Carbide Tools** (No. OE 241).

**Grinding Single-Point Tools** (No. OE 242).

**Grinding Multiple-Point Tools** (No. OE 243).

**Cutting with Carbide Tools, Part I: Single Point** (No. OE 244).

**Cutting with Carbide Tools, Part II: Milling Cutters** (No. OE 245).

**Blueprint Reading** (5 filmstrips). The fundamentals of reading and interpreting blueprints used in the machine shop.

**Visualizing an Object** (No. OE 51). How a blueprint is developed; how dimensions are shown by different views; how various kinds of lines are shown and how special information is indicated.

**Reading a Three-view Drawing** (No. OE 52). How to use a blueprint to visualize an object; how to interpret blueprints; example showing how to make tool block according to specifications.

**Principal Dimensions, Reference Surfaces and Tolerances** (No. OE 53). Relationship between blueprint and rough and finished casting; comparison of dimensions with blueprint; how cross-section view is derived from full view; how to use blueprint as guide in selecting reference surfaces from which to take other dimensions; interpreting tolerances; use of blueprint in checking accuracy of finished work.



**Sectional Views and Projections, Finish Marks** (No. OE 54). Different types of lines—dimension, center, cross section, and object; projection of sectional view; locations and uses of finish marks; meanings of standard cross-section lines denoting types of materials.

**Reading a Drawing of a Valve Bonnet** (No. OE 55). Interpretation of symbols and tolerance specifications, conventional and cross-section views on a blueprint; use of blueprint as guide in planning machine operations.

**Soldering** (2 filmstrips). Theory, tools, materials, and procedures.

**Hand Soldering** (No. OE 479).

**High Frequency Soldering** (No. OE 480).

**Bench Work** (8 filmstrips). Methods, operations, and procedures in typical benchwork.

**Cutting Threads with Taps and Dies** (No. OE 34).

**Scraping Flat Surfaces** (No. OE 35).

**Fitting and Scraping Small Bearings** (No. OE 36).

**Reaming with Straight Hand Reamers** (No. 37).

**Reaming with Taper Hand Reamers** (No. OE 38).

**Centering Small Stock** (No. OE 39).

**Laying Out Small Castings** (No. OE 40).

**Fundamentals of Filing** (No. OE 41).

**Engine Lathe** (17 filmstrips). Demonstrations of procedures in various engine-lathe operations, including setting up, sequence of operations, safety precautions, care of tools and machine, use of controls.

**Rough Turning between Centers** (No. OE 6).

**Turning Work of Two Diameters** (No. OE 7).

**Cutting a Taper with the Compound Rest and with a Taper Attachment** (No. OE 8).

**Drilling, Boring and Reaming Work Held in Chuck** (No. OE 9).

**Cutting an External National Fine Thread** (No. OE 10).

**Turning a Taper with the Tailstock Set Over** (No. OE 44).

**Cutting an External Acme Thread** (No. OE 45).

**Cutting an Internal Acme Thread** (No. OE 56).

**Cutting an Internal Taper Pipe Thread** (No. OE 57).

**Turning Work Held on a Fixture** (No. OE 58).

**Boring to Close Tolerances** (No. OE 59).

**Machining Work Held in Chuck—Use of Reference Surfaces** (No. OE 60).

**Turning Work Held on a Mandrel** (No. OE 61).

**Using a Steady Rest** (No. OE 62).

Using a Follower Rest (No. OE 63).

Using a Boring Bar Between Centers (No. OE 64).

Using a Steady Rest When Boring (No. OE 65).

**Drill Press** (5 filmstrips). Procedures in drill press work, including proper setup and operations.

Drilling and Tapping Cast Steel (No. OE 22).

Drilling to a Layout and Spotfacing Cast Iron (No. OE 23).

Drilling a Hole in a Pin (No. OE 46).

Locating Holes, Drilling and Tapping in Cast Iron (No. OE 47).

Countersinking, Counterboring and Spot Facing (No. OE 48).

**Turret Lathe** (7 filmstrips). Procedures in turret lathe work, including functions of major parts, setting up, sequence of operations on specific jobs, use of tools and attachments.

The Turret Lathe—An Introduction (No. OE 212).

Chuck Work, Part I: Setting Up Hexagon Turret Tools (No. OE 213).

Chuck Work, Part II: Setting Up Tools for Combined Cuts (No. OE 214).

Setting Up and Machining Bar Stock (No. OE 215).

Bar Work—Magnesium, Part I: Setting Up Bar Mechanism and Roller Turner (No. OE 216).

Bar Work—Magnesium, Part II: Setting Up Multiple Roller Turner and Turning a Taper (No. OE 217).

Bar Work—Magnesium, Part III: Necking and Threading by Use of Attachment and by Die Head (No. OE 218).

**Milling Machine** (10 filmstrips). Procedures in milling machine work, including basic operating principles, setting up, sequence of operations on specific jobs, determining proper feeds and speeds.

The Milling Machine (No. OE 11).

Cutting Keyways (No. OE 12).

Straddle and Surface Milling to Close Tolerances (No. OE 13).

Straddle Milling (No. OE 14).

Plain Indexing and Cutting a Spur Gear (No. OE 15).

Milling a Template (No. OE 207).

Cutting a Short Rack (No. OE 208).

Boring Holes with Offset Boring Head (No. OE 209).

Milling a Helical Cutter (No. OE 210).

Cutting Teeth on a Worm Gear (No. OE 211).

**Vertical Milling Machine** (5 filmstrips). Procedures in vertical milling-machine work, including differences from other milling machines, calculating



feeds and speeds, sequence of operations on specific jobs, use of tools and attachments.

Using a Shell End Mill (No. OE 72).

Cutting a Dovetail Taper Slide (No. OE 73).

Cutting a Round End Keyway (No. OE 74).

Milling a Helical Groove (No. OE 75).

Milling a Circular T-slot (No. OE 76).

**Metal-cutting Band Saw** (2 filmstrips). Procedures and operations, including saw and file selection, setting up, operations on specific jobs.

Sawing an Internal Irregular Shape (No. OE 239).

Filing an Internal Irregular Shape (No. OE 240).

**Single Point Cutting Tools** (2 filmstrips). Fundamentals of single-point cutting tools, including name and location of parts, types, and uses of tools, setting and proper care.

Fundamentals of Side Cutting Tools (No. OE 42).

Fundamentals of End Cutting Tools (No. OE 43).

**Center-type Grinder** (5 filmstrips). Procedures in typical operations on center-type grinders, including setting up, selecting correct grinding wheel, mounting work.

Grinding a Plain Pin, Part I: The Grinding Wheel (No. OE 80).

Grinding a Plain Pin, Part II: Grinding Operations (No. OE 81).

Grinding a Slender Shaft with Back Rest (No. OE 82).

Plunge Cut Grinding (No. OE 83).

Grinding a Taper (No. OE 84).

**Centerless Grinder** (5 filmstrips). Procedures in typical operations, including principle and basic elements of centerless grinder, setting up; principles of through-feed, infeed, and endfeed grinding.

Thrufeed Grinding a Straight Pin (Part I, No. OE 85).

Thrufeed Grinding a Straight Pin (Part II, No. OE 86).

Infeed Grinding Shouldered Work (No. OE 87).

Infeed Grinding a Shaft of Two Diameters (No. OE 88).

Endfeed Grinding a Tapered Pin (No. OE 89).

**Surface Grinder** (5 filmstrips). Procedures and operations, including positioning and mounting tools and wheels, use of controls, checking work for accuracy.

Grinding a Parallel Bar, Part I: Setting Up the Machine (No. OE 220).

Grinding a Parallel Bar, Part II: Grinding Operations (No. OE 221).

Grinding a Template (No. OE 222).

**Grinding a V Block (No. OE 223).**

**Grinding Thin Discs (No. OE 224).**

**Internal Grinder (3 filmstrips).** Procedures and operations, including setting up, selection and adjustment of wheels, checking finished work.

**Grinding a Straight Hole (No. OE 77).**

**Grinding a Deep Hole (No. OE 78).**

**Grinding and Facing a Blind Hole (No. OE 79).**

**Cutter Grinder (5 filmstrips).** Procedures and operations, including parts of cutter, selection and mounting of grinding wheels and cutters, checking work.

**Sharpening a Side Milling Cutter (No. OE 90).**

**Sharpening a Plain Helical Cutter (No. OE 91).**

**Sharpening a Shell End Mill (No. OE 92).**

**Sharpening a Form Relieved Cutter (No. OE 93).**

**Sharpening an Angular Cutter (No. OE 94).**

**Horizontal Boring Mill (6 filmstrips).** Procedures and operations, including correct setup, determining feeds and speeds, use of tools and attachments.

**Setup for Face Milling with a Fixture (No. OE 225).**

**Face Milling with a Fixture (No. OE 226).**

**Contour Face Milling (No. OE 227).**

**Setup for Rough Line-Boring (No. OE 228).**

**Rough Line-Boring (No. OE 229).**

**Drilling, Tapping, Stub-boring, and Reaming (No. OE 230).**

**Vertical Boring Mill (3 filmstrips).** Procedures and operations, including setting up, mounting work, indexing, using controls.

**Rough Facing, Turning and Drilling (No. OE 16).**

**Rough Facing and Boring and Turning a Shoulder on Vertical Turret Lathe (No. OE 17).**

**Facing, Turning, Boring, Grooving and Chamfering (No. OE 18).**

**Broaching Machine (3 filmstrips).** Procedures and operations, including explanation of internal broaching, principles of broaching tools, selection of tools, setting up, mounting-work fixtures and toolholders.

**Broaching an Internal Keyway (No. OE 236).**

**Single Ram Vertical Surface Broaching (No. OE 237).**

**Double Ram Vertical Surface Broaching (No. OE 238).**

**Shaper (3 filmstrips).** Procedures and operations, including selection of tools, setting up, selection of ram stroke, speeds, and feeds.

**Cutting a Keyway on End of a Finished Shaft (No. OE 19).**

**Machining a Cast Iron Rectangular Block (No. OE 20).**

**Machining a Tool Steel V Block (No. OE 21).**



**Planer** (2 filmstrips). Procedures and operations, including function of planer, preparation of machine and tools, mounting workpiece, setting up, making rough, finish, and angle cuts.

**Planing a Flat Surface** (No. OE 66).

**Planing a Dovetail Slide** (No. OE 67).

**Gear Hobber** (5 filmstrips). Procedures and operations, including selection of hob, feeds, speeds, selection, and mounting of fixtures.

**Hobbing a Spur Gear, Part I: Setting Up the Change Gears** (No. OE 231).

**Hobbing a Spur Gear, Part II: Setting Up and Hobbing the Work** (No. OE 232).

**Hobbing a Square Tooth Spline Shaft** (No. OE 233).

**Hobbing a Worm Gear—Infeed Method** (No. OE 234).

**Hobbing a Helical Gear, Two Cuts—Nondifferential Method** (No. OE 235).

**Machine Tools Series** (Castle, made by Army Air Forces, 4 parts, si). Introductions to basic machine tools, including the lathe, the milling machine, planers, and the shaper. The films are long, containing much information for one class session (except when used for review purposes); however, they are so organized that sequences may be shown as desired. Each strip gives nomenclature, practical uses, and operation of the machine tool indicated in the title. The four parts are listed below with indications of additional subject matter.

**Machine Tools: The Lathe** (No. FS 1-4, 91 frames). Parts, function, and operation; holding work in lathe; selection and use of cutting tools; selection of tool angle, feed, and speed; cutting tapers; thread-cutting operations; precautions; use of measuring instruments.

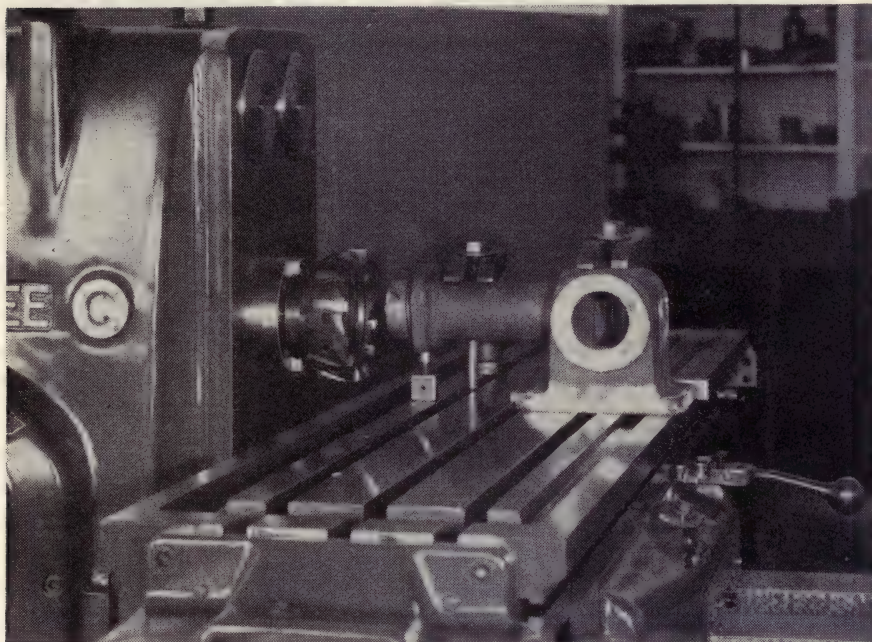
**Machine Tools: The Milling Machine** (No. FS 1-5, 58 frames). Parts, function, and operation; cutting-speed selection; types of cutting tools and their uses; setting up and operating.

**Machine Tools: Planers** (No. FS 1-6, 56 frames). Function and operation of parts; precautions; holding work; aligning work.

**Machine Tools: The Shaper** (No. FS 1-7, 57 frames). Parts, function, and operation; selection of cutting speeds; holding work on shaper table; precautions.

**Making Curved Flanges** (Castle, made by U.S. Navy, No. SN-291, si, 62 frames). Procedures and tools used in hand-forming a flange on an aluminum disk and an aluminum rectangular tray. Well organized; operations shown in detail.

**Milling Practice Series** (Kearney & Trecker, 5 filmstrips, sd, and 1 filmstrip, si, about 30 minutes each, color, instructor's manual). Fundamentals and applications of milling practice in 5 filmstrips (sound). The sixth (silent) strip is designed for use as a review. The films are long, presenting much material for one class session.



From "Milling Practice" training series. (Kearney & Trecker.)

Data sheets and other text frames tend to be lengthy, reducing legibility. Treatment involves showing of both correct and incorrect practices. Individual parts are listed below with brief descriptions.

**Milling Practice Part I.** Definition of milling; history of milling machines. Fundamentals of good machine-tool practice including correct setup, dimensional accuracy, and economical operations. Construction and operation of standard type of machine. Use of various attachments. Safety devices.

**Milling Practice Part II.** Reviews Part I briefly. Further requirements for good cutting and dimensional setups. Study of cutting forces and their importance. Operation of machine, including conventional and climb milling, conditions affecting speeds and feeds, selection of cutters, use of coolant. Importance of correct setup. Maintenance and care of machine and its parts. "Good housekeeping" and personal safety hints.



**Milling Practice Part III, IV, and V.** Each of these three parts present a series of actual machine setups and milling operations, demonstrating the principles described in Parts I and II. Includes job-description data sheets: material, machine, speed, feed, production rate, fixture cutters. Each data sheet followed by photographs of setup as important points of job are explained in recorded lecture. Process of doing the jobs is not shown, only method of dimensional and cutting setup and choice of speeds. Right and wrong methods are pointed out.

**Milling Practice Part VI** (si, 50 frames). To be used as review of foregoing five parts in conjunction with questions in instructor's booklet. Includes illustrative material for questions concerning parts and attachments, supporting methods, cutter sizes, selection of speeds and feeds, formula for surface feet per minute, chip loads, operating data sheets for jobs illustrated in Parts III, IV, and V.

**Patternmaking** (Castle, made by USOE, 2 groups, 21 filmstrips, si, manuals). Designed for use in conjunction with motion pictures of the same titles, but may be used independently, particularly for review purposes or as discussion guides. The strips review information presented in the motion pictures, using photographs and diagrams with question or problem captions and some statements of important points as summary or emphasis. Individual titles are listed below. Descriptions are not included since the titles are self-explanatory.

**Fundamentals of Patternmaking** (11 filmstrips). "How-to-do" films, reviewing the details of construction.

**Making a One-piece Flat Pattern** (No. OE 321).

**Making a Pattern with a Vertical Core** (No. OE 322).

**Making a Pattern with a Horizontal Core** (No. OE 323).

**Making a Pattern with a Tail Print** (No. OE 324).

**Making a Core Box for a Tail Print** (No. OE 350).

**Making a Segmented Pattern** (No. OE 325).

**Making a Pattern for a Three-part Mold** (No. OE 326).

**Making a Pattern for a Flanged Pipe Elbow** (No. OE 327).

**Making a Matchboard Pattern** (No. OE 328).

**Making a Core Box for a Vertical Core** (No. OE 329).

**Making a Core Box for a Flanged Pipe Elbow** (No. OE 330).

**Problems in Patternmaking** (10 filmstrips). Preliminary planning of patterns; each film reviews analysis of specific patternmaking problems including advantages and disadvantages of different methods, requirements of jobs.

**Making a Pattern Using a Green and Dry Sand Core** (No. OE 331).

**Making a Pattern Requiring a Cover Core** (No. OE 332).

**Making a Pattern Requiring Box Construction (No. OE 333).**

**Making a Core Box for a Machine Base (No. OE 334).**

**Making a Pattern Requiring Segmental Construction (No. OE 335).**

**Redesigning a Pattern for Production Purposes (No. OE 336).**

**Designing a Pattern for a Water-cooled Motor Block (No. OE 337).**

**Designing Core Boxes for a Water-cooled Motor Block (No. OE 338).**

**Making a Master Pattern and Core Boxes for a Water-cooled Motor Block (No. OE 339).**

**Making a Pattern for a Machine Molded Steel Globe and Angle Valve (No. OE 340).**

**Sand Bag Bumping (Castle, made by U.S. Navy, No. SN-293, si, 49 frames).**

Tools used and step-by-step procedure in making small metal repair parts for planes by using the sand bag. Includes preparing template, cutting metal, selecting tools, bumping the metal properly, finishing the job smoothly. Operations shown in detail. Well organized and clearly presented. May also interest classes in aircraft maintenance.

**Sheet Metal Work (Castle, made by USOE, 4 groups, 24 filmstrips, si, manuals).**

Designed for use in conjunction with motion pictures of the same titles, but may be used independently, particularly for review purposes or as discussion guides. The filmstrips review information presented in the motion pictures, using photographs and diagrams with question or problem captions and some statements of important points as summary or emphasis. Individual titles are listed below. Descriptions are not included as the titles are self-explanatory.

**Forming Sheet Metal (6 filmstrips).** Review details of typical forming operations.

**Forming with Rubber on the Hydraulic Press (No. OE 133).**

**Forming on Rotary Machines (No. OE 290).**

**Forming on a Hand-operated Brake (No. OE 134).**

**Finish Forming by Hand (No. OE 135).**

**Forming with a Drop Hammer (No. OE 291).**

**Forming on the Stretching Machine (No. OE 251).**

**Assembling and Riveting (9 filmstrips).** Reviews details of procedure and operations.

**Assembling in a Jig (Fitting and Lining Up) (No. OE 136).**

**Assembling in a Jig (Drilling and Riveting) (No. OE 137).**

**Drilling with Portable Drill Motors (No. OE 138).**

**Dimpling and Countersinking (No. OE 139).**

**Driving and Bucking Rivets (No. OE 140).**

**Removing Defective Rivets (No. OE 141).**



**Squeeze Riveting—Stationary and Portable Riveters** (No. OE 293).

**Blind Riveting** (No. OE 294).

**Spot Welding** (No. OE 295).

**Blanking Sheet Metal** (4 filmstrips). Review details in four blanking methods.

**Blanking Sheet Metal on the Squaring Shear** (No. OE 130).

**Blanking Sheet Metal with Hand Snips** (No. OE 131).

**Blanking with the Swing Arm Router** (No. OE 132).

**Blanking with Rotary and High Speed Shears** (No. OE 292).

**Templates** (5 filmstrips). Reviews details in preparation of templates.

**Making a Master Contour Template** (No. OE 125).

**Making a Master Developed Layout** (Part I, No. OE 126).

**Making a Master Developed Layout** (Part II, No. OE 127).

**Sawing Template Metal** (No. OE 128).

**Filing Template Metal** (No. OE 129).

For supplementary and related material, see also the Aviation Metalsmith's Series.

## OPTICAL CRAFTSMANSHIP

**Care and Cleaning of Photographic Lenses** (Castle, made by Army Air Forces, No. FS 1-48, si, 58 frames). Indicates importance of proper care and cleaning of lenses; effects of improperly cleaned lenses. Gives precautions to be observed in use and handling of lenses, methods of cleaning lenses. Ends with review test. Well-organized and clearly presented information. May also interest photographic clubs.

**Optical Craftsmanship** (Castle, made by USOE, 6 filmstrips, si, manuals). Designed for use in conjunction with motion pictures of the same titles, but may be used independently, particularly for review purposes or as discussion guides. The strips review information presented in the motion pictures, using photographs and diagrams with question or problem captions and some statements of specific important points. Individual titles are listed below with brief indications of subject matter reviewed.

**Rough Grinding—Spherical Surfaces** (No. OE 180). Three methods of rough-grinding lenses—by hand, by pin-bar, by mechanical curvature generator. Details of hand grinding; how to use job card, check tool curvature, handle lens blanks, check lens curvature, and clean the grinding tool.

**Rough Grinding by Pin-Bar—Spherical Surfaces** (No. OE 181). How to use the job card, select and adjust grinding tool, use abrasive, grind by pin-bar, clean grinding tool, and correct worn grinding tools.

**Pitch Buttoning and Blocking—Spherical Surfaces** (No. OE 182). How to warm lenses and pitch for buttoning, apply pitch to warm lenses, fit form tool on lens surface, block lenses in metal shell preparatory to fine grinding.

**Fine Grinding—Spherical Surfaces** (No. OE 183). How to set up lenses in multiple-spindle machine, adjust grinding machine for grinding concave or convex lenses, wash and inspect lenses after fine grinding.

**Polishing—Spherical Surfaces** (No. OE 184). How to make a concave or convex polishing shell, trim the polishing shell to size and cut breathers, set up and use polishing machine, make a Newton's ring check with test glass, correct for hollow condition and high condition.

**Centering, Edge Grinding and Beveling—Spherical Surfaces** (No. OE 185). How to center lenses by collinator, set up lenses for edge and bevel grinding in single-spindle or two-spindle machine, edge and bevel grind lenses.

**Properties of Photographic Lenses** (Castle, made by Army Air Forces, No. FS 1-47, si, 65 frames). Function of the lens; pinhole lenses; focal length of lenses; size of image; necessity for focusing lens; inversion of the image. Circle of confusion; types of single lenses; chromatic aberration, achromatic lens, spherical aberration, curvilinear distortion, anastigmat lenses.

## PLASTICS

**Plastics** (Castle, made by USOE, 10 filmstrips, si, manuals). Designed to be used in conjunction with motion pictures of the same titles, but may be used independently as discussion guides or for review purposes. The strips review the information presented in the motion pictures through photographs and diagrams with question captions and some statements of specific important points. Individual titles with brief indication of subject matter reviewed are listed below.

**Origin and Synthesis of Plastics Materials** (No. OE 466). Organic origin of plastics and resemblance of synthetic compounds to natural substances; synthesis of plastics from natural substances; differences between thermosetting and thermoplastic materials; compounding plastics to provide desired properties in products; forms in which plastics are produced; typical plastics products.

**Methods of Processing Plastics Materials** (No. OE 467). Fundamentals of compression, transfer, extrusion, and injection molding methods; finishing of



molded parts; fundamentals of lamination; machining of laminated and other plastics products.

**Preparing the Charge and Loading the Mold** (No. OE 468). How to set up the press, weight the charge, preheat the charge, clean and lubricate the mold, and load the mold.

**Molding a Simple Part** (No. OE 469). How to close the mold, breathe the mold, open the mold, prevent pieces from warping, coordinate steps of molding cycle.

**Molding a Part with Inserts** (No. OE 470). How transfer molding differs from compression molding; how to determine whether part should be molded by transfer method, mold a part by transfer method, coordinate steps of molding cycles.

**Semiautomatic and Hand Molding of Intricate Parts** (No. OE 471). How to mold a part with undercuts, position wedges, and close the mold, mold a part with complicated shape, assemble hand mold, disassemble hand mold.

**Setting up the Press and Molding a Part** (No. OE 472). What happens in plunger cylinder, heating cylinder, and mold during injection molding. How to set up injection molding press for specified job, avoid dampness and contamination of molding material, maintain operating cycle, and prevent damage to mold and press.

**Cleaning and Servicing the Press** (No. OE 473). How to disassemble heating cylinder, clean cylinder, hopper, and feeder mechanism, give entire press routine cleaning, prepare scrap material for reuse.

**Finishing Molded Parts** (No. OE 474). How to finish typical molded part, trim gate with band saw, sand with drum sander, retap metal inserts, remove flash from contours by hand sanding and filing, file and scrape cavities, buff and polish surfaces, finish and polish by tumbling.

**Machine Laminated Plastics** (No. OE 475). How to machine typical laminated part, cut tube stock to length on circular saw, turn outside diameters on lathe, machine inside diameters by boring with lathe, finish machining of part on milling machine.

## REFRIGERATION SERVICE

**Refrigeration Service** (Castle, made by USOE, 15 filmstrips, 2 groups, si, manuals). Designed for use in conjunction with motion pictures of the same titles, but may be used independently for review purposes or as discussion guides. The strips review the information presented in the motion pictures through photographs and diagrams with question or problem captions, including some

statements of specific important points. Individual titles with indications of subject matter reviewed are listed below.

**Domestic Systems (10 filmstrips).**

**Checking the System, Part I: General Procedures (No. OE 438).** How to install gauges in domestic refrigerator, check operating pressures, compressor performance, and temperature range of cooling unit, clean condenser and oil motor of open-type refrigeration unit.

**Checking the System, Part II: Trouble Shooting (No. OE 439).** How to install gauge manifold in domestic refrigerator; check abnormal head pressure and abnormal back pressure, determine causes of common troubles such as "unit will not run," "no refrigeration but unit runs continuously," and "improper refrigeration of food but unit freezes ice cubes."

**Locating and Repairing Leaks (No. OE 440).** How to use gauge manifold in building leak-testing pressures in domestic refrigerator; test for sulphur dioxide and methyl chloride leaks, use halide torch to locate freon leaks, repair several types of leaks.

**Adding or Removing Refrigerant (No. OE 441).** How to check a domestic refrigerator for lack of refrigerant, add refrigerant for leak testing, add refrigerant by weight, add unmeasured amount of refrigerant, remove refrigerant.

**Removing and Installing a Compressor or Condenser (No. OE 442).** How to evacuate and remove compressor in domestic refrigerator, evacuate a stuck compressor, install compressor, remove and install condenser.

**Removing and Installing a Cooling Unit (No. OE 443).** Common cooling unit disorders in domestic refrigerator; how to evacuate valved evaporators, remove oil-logged evaporator, install evaporator, install direct expansion cooling unit.

**Adjusting and Checking the Expansion Valve (No. OE 444).** Design and operation of bellows-type automatic expansion valve and diaphragm-type automatic expansion valve; how to adjust, check, and service bellows-type valve.

**Checking and Replacing a Float Valve (No. OE 445).** Function and action of two basic types of float valves—high-side float and bow-side float; how to correct troubles in both types and to replace a high-side float.

**Checking the Electrical System (No. OE 446).** How to check and service an overheated motor in domestic refrigerator, check and service stalled capacitor or RI motor, check and service motor control disorders; how thermostatic motor control functions; elements of range and differential adjustments.



**Quieting a Noisy Refrigerator** (No. OE 447). How to check and correct noise caused by high head pressure or oil-logged evaporator, correct compressor noises, check and correct motor noises, correct noises caused by wear or looseness of parts.

**Commercial Systems** (5 filmstrips).

**Adjusting and Repairing the Thermo Expansion Valve** (No. OE 448). Theory of multiple refrigeration systems; types of thermo expansion valves; how to test and adjust thermo expansion valve and how to recognize symptoms of troubles in the valve; servicing the valve.

**Adjusting Pressure Actuated Temperature Control Devices** (No. OE 449). Purpose of pressure-actuated temperature-control devices; how to adjust pressure-actuated motor control, adjust metering-type two-temperature valve and the snap-action two-temperature valve; purpose of suction-line check valve.

**Adjusting Commercial Thermostatic Controls** (No. OE 450). Purpose of thermostatic motor control; safety principle of high-pressure safety cutout and principles of thermostatic element of two-temperature valve. How to test and adjust thermostatic motor control, adjust thermostatic two-temperature valve and thermostatic water valve.

**Servicing Water Cooled Condensers** (No. OE 451). Theory of counter-flow condenser, essential elements of water-cooled system, and operation of electric water valve; how to regulate water valve, to purge system, and to detect dirty condenser.

**Making and Repairing Tubing Connections** (No. OE 452). How to straighten copper tubing, work, cut, and dress copper tubing, make flare for various sizes of tubing, sweat-in a connector to cover a break.

## SHIPBUILDING

**Shipbuilding Series** (Photo & Sound Prod., 5 groups, 30 filmstrips, si, 2 filmstrips, sd). Although these filmstrips are designed specifically for shipbuilding instruction, some of them may be adapted for use in other classes such as machine shop, carpentry, drafting, etc. Those strips describing the care or use of specific tools, instruments, or equipment may be of interest to any vocational training classes concerned with the materials discussed, although the applications shown in the strips pertain specifically to shipbuilding. Two groups are particularly adaptable to other uses: (1) "Blueprint Reading"—of this group the first two are general introductory material with some reference to shipbuilding in examples;

the last three are more specifically shipbuilding material since the lines, symbols, sections, details, etc., are those used in such work. However, the same lines, symbols, etc., in most cases, are also used in other blueprints. (2) "Rigging" (sound)—although the filmstrips are listed in shipbuilding series, the treatment is confined to the use and care of the equipment discussed, and therefore the strips should be of interest to any vocational classes interested in uses of cranes, chain falls, and pressure cylinders.

In general, the strips in this series are brief, clearly organized, and well visualized. Individual titles are listed below. Descriptions are not included since the titles are self-explanatory.

**Basic Tools and Operations (13 filmstrips)**

- How to Lay a Chalk Line
- How to Center Punch
- Handling Steel Tape
- Care and Use of Soapstone
- How to Use the Trammel Rule
- Elementary Shipyard Geometry
- Basic Ship Lines
- Care and Use of Templates
- How to Use the Combination Square
- How to Check Declivity
- How to Use the Reverse Marker
- Care and Use of the Spirit Level
- How to Use a Plumb Line

**Prefabrication (6 filmstrips).**

- Laying Out Plates to Size
- How to Lay Out a Plate Unit
- How to Set Vertical Keel
- How to Set Floors and Intercoastals
- How to Assemble a Flat Shell Unit
- How to Fit Riveted Frames to Flat Shell

**Installation (5 filmstrips).**

- Laying Out Flat Keel
- Fitting Doublebottom Unit to Hull
- How to Set Margin Brackets
- Work Lines, Pitch Marks and Landings
- Molded Lines

**Blueprint Reading (5 filmstrips).**

- Introduction to Blueprints



**Blueprints****Standard Blueprint Lines****Standard Blueprint Symbols****Blueprint Sections, Details and Alterations****Rigging (3 filmstrips).****Crane Signals****Handling Pressure Cylinders****Care and Use of Chain Falls**

**Shipbuilding Series** (Castle, made by USOE, 5 groups, 40 filmstrips, si, manuals). Designed for use in conjunction with motion pictures of the same titles, but may be used independently, particularly for review purposes or as discussion guides. The filmstrips review the information presented in the motion pictures, using photographs and diagrams with question or problem captions and some statements of important points. Individual titles are listed below. Descriptions are not included since the titles are self-explanatory.

**Coppersmithing (4 filmstrips).****Brazing Flanges with Silver Solder (No. OE 104).****Brazing Flanges with Spelter (No. OE 103).****Bending Copper Tubing to a Wire Template (No. OE 102).****Tinning and Solder Wiping (No. OE 343).****Pipefitting (10 filmstrips).****Measuring Pipe, Tubing and Fittings (No. OE 105).****Cutting and Threading Pipe by Hand (No. OE 106).****Cutting and Threading Pipe on a Power Machine (No. OE 107).****Making a Cold Bend on a Hand-powered Machine (No. OE 108).****Covering Hot and Cold Pipes (No. OE 109).****Laying Out and Installing Hangers (No. OE 120).****Pipe Fabrication with Jigs (No. OE 122).****Installing Vitreous Fixtures (No. OE 121).****Installing Valves in Engine Room Systems (Part I, No. OE 123).****Installing Valves in Engine Room Systems (Part II, No. OE 124).****Shipfitting (10 filmstrips).****Preparing and Setting a Keel Block and Bottom Cradle (No. OE 24).****Innerbottom Section: Sub-Assembly of Closed Floor; Sub-Assembly of Open Floor (No. OE 25).****The Innerbottom: Setting Up Floors and Longitudinals (No. OE 26).****Side Frames: Sub-Assembly of Web Frame (No. OE 27).****Deck Girders: Sub-Assembly (No. OE 28).****The Deck: Setting a Web Frame and a Transverse Beam (No. OE 29).**

Laying Off the Boundary, Stiffeners, Water Lines and Buttock Lines (No. OE 30).

Bulkhead: Laying Off and Fitting Centerline Stiffener (No. OE 31).

Bulkhead: Setting Transverse Watertight Bulkhead into Hull (No. OE 32).

Deck Plates: Regulating and Setting (No. OE 33).

Marine Machinery Installation (9 filmstrips).

How to Check and Surface Foundations (No. OE 95).

Aligning and Installing Auxiliary Machinery (No. OE 96).

Filing and Installing Chocks (No. OE 97).

Laying Out, Drilling and Tapping Flanges on Sea Chest (No. OE 98).

Installing Valves and Strainer on Sea Chest (No. OE 99).

Laying Out and Installing Stern Tube, Tail Shaft and Propeller, Part I: Running a Temporary Line (No. OE 100).

Laying Out and Installing Stern Tube, Tail Shaft and Propeller, Part II: Laying Off Bulkheads (No. OE 101).

Laying Out and Installing Stern Tube, Tail Shaft and Propeller, Part III: Running a Permanent Line and Boring (No. OE 341).

Laying Out and Installing Stern Tube, Tail Shaft and Propeller, Part IV: Fitting Tube, Shaft and Propeller (No. OE 342).

Marine Electricity (7 filmstrips).

Laying Out and Installing Kickpipes and Stuffing Tubes (No. OE 110).

Laying Out and Installing Main Wireway (No. OE 111).

Identifying and Precutting Cable (No. OE 112).

Pulling and Installing Cable and Packing Terminal Tubes (No. OE 113).

Laying Out and Installing Compartment Fixtures (No. OE 114).

Wiring Telltale Panel (No. OE 115).

Installing and Connecting Telltale Panel (No. OE 116).

## WELDING

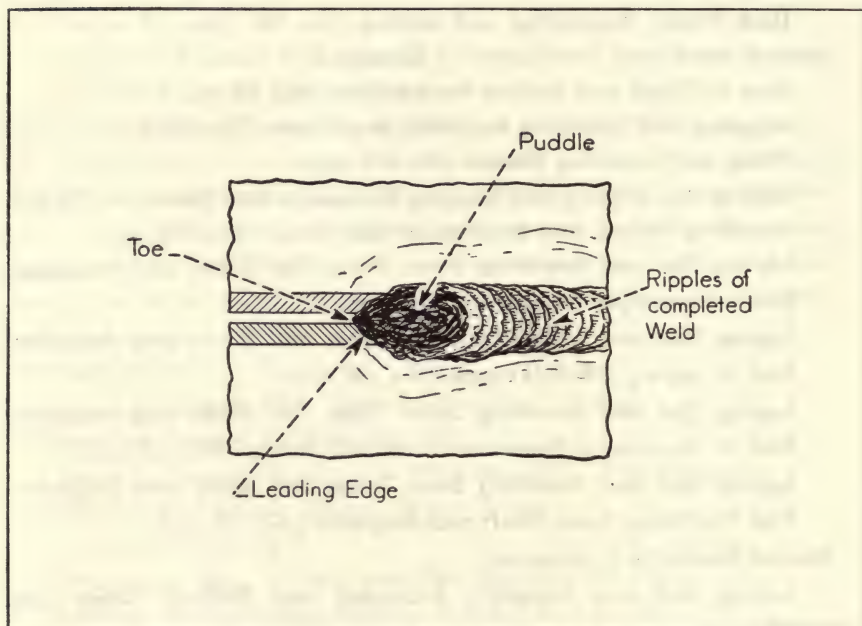
Oxyacetylene Welding (Jam Handy, 5 groups, 15 filmstrips, si). The basic manual skills required in welding operations, designed for showing prior to practice work by students. Most of the strips indicate in closing frames that the weld made during practice period should be shown to the instructor for checking. Treatment and subject matter is suitable for any beginning welding instruction.



The filmstrips tend to considerable text material. Individual titles are listed below with brief descriptions.

**Kit A—Preparatory (2 filmstrips).**

**An Introduction to Welding (No. A-1, 64 frames).** Oxyhydrogen and



From filmstrip "Principles of Oxyacetylene Welding." (Linde Air Products Co.)

oxyacetylene welding. Equipment, construction, and use. Pressure gauges and torches—construction and uses. Safety precautions.

**Setting Up and Lighting the Welding Torch (No. A-2, 65 frames).**

Correct use of equipment and safety precautions. Preparing the working area. Steps in setting up equipment. Procedures in lighting torch. Putting away equipment.

**Kit B—Elementary Practice (2 filmstrips).**

**Welding Flat Ripples (No. B-1, 35 frames).** Tools, equipment, and materials needed. Setting up equipment and placing work correctly. Methods of welding flat ripples, uses of such welds, correct procedures, causes of failures.

**Flat Butt Welds (No. B-2, 47 frames).** Preparation; tools, equipment, and materials. Procedures and welding methods. Inspection of weld. Tests.

**Kit C—Further Practice (Steel) (5 filmstrips).**

**Fillet Welds—Steel** (No. C-1, 24 frames). Tools, equipment, materials, and preparation. Description of fillet welds. Procedures and methods. Inspection of weld.

**Vertical Welds—Steel** (No. C-2, 41 frames). Vertical fusion welding, lap welding, fillet welding, cross welding. Tools, equipment, procedures, precautions, and inspection of completed weld. Uses of vertical welds.

**Tube Welds—Steel** (No. C-3, 58 frames). Materials, preparations, specific operations. Definition of tube welds; appearance of completed weld.

**Cluster Welds** (No. C-4, 32 frames). Definition. Special tools, preparations, materials. Preparing the work; inspection before starting weld; steps in welding.

**Welding Stainless Steel** (No. C-5, 38 frames). Tools, materials, equipment. Characteristics of stainless steel. Procedures in welding. Appearance and characteristics of proper weld.

**Kit D—Further Practice (Aluminum) (3 filmstrips).**

**Welding Aluminum Flat Sheets** (No. D-1, 69 frames). Characteristics of aluminum; use of flux; making tack welds; butt weld; lap weld; wandering weld. Causes of defects.

**Welding Aluminum Tubes with Sheets** (No. D-2, 32 frames). Review of aluminum welding properties. Use of flux. Preparation of materials and equipment. Procedures in welding. Fillet weld and welding flanges. Precautions.

**Fuel and Oil Tank Repairs** (No. D-3, 32 frames). Preparation; cleaning metals; safety precautions; tack welding; testing of completed welds.

**Kit E—Special Practice (3 filmstrips).**

**Oxyacetylene Cutting** (No. E-1, 39 frames). Cleaning and preparing the cut. Preparation of cutting torch. Safety precautions. Procedures in cutting. Appearance of correct cut.

**Brazing and Silver Soldering** (No. E-2, 41 frames). Definitions. Tools, equipment, and materials. Types of solder. Steps in running plain bronze bead on flat metal sheet; in depositing bead across sheet of iron. Working with cast iron. Steps in silver soldering.

**Qualification Test for Welders** (No. E-3, 59 frames). Summarizes the types of welds required in the Aircraft Gas Welder's (steel) test, indicating materials needed, specifications, and testing of each weld for strength and soundness.



**Oxyacetylene Welding Processes** (Linde Air Co., 3 series, 20 filmstrips, si, instructor's manual and student lesson booklets). Information on equipment, materials, precautions, and procedures for welding and cutting by oxyacetylene processes where cylinder gases are used and where pipe-line gases are used. Processes for the two types of gas supply are covered in separate filmstrips. If interested in only one type, the training units are available as follows: Cutting Series—cylinders only. Cutting Series—pipe lines only. Welding Series—cylinders only. Welding Series—pipe lines only. The filmstrips tend to be lengthy, but cover operations in detail. Individual titles are listed below. Descriptions are not provided since the titles are self-explanatory.

**Cutting Series (8 filmstrips).**

**Setting Up Oxyacetylene Cutting Equipment**—Supplied from Single Cylinder of Oxygen and Single Cylinder of Acetylene (No. C-1, 65 frames).

**Setting Up Oxyacetylene Cutting Equipment**—Supplied with Oxygen and Acetylene from Pipe Lines (No. C-1A, 63 frames).

**Lighting and Adjusting the Cutting Blowpipe**—Supplied from Single Cylinder of Oxygen and Single Cylinder of Acetylene (No. C-2, 55 frames).

**Lighting and Adjusting the Cutting Blowpipe**—Supplied with Oxygen and Acetylene from Pipe Lines (No. C-2A, 55 frames).

**Principles of Oxyacetylene Cutting** (No. C-3, 68 frames).

**Manual Straight-Line Cutting** (No. C-4, 115 frames).

**Testing for and Fixing Leaks in Oxyacetylene Cutting Equipment**—Supplied from Single Cylinder of Oxygen and Single Cylinder of Acetylene (No. S-2, 87 frames).

**Testing for and Fixing Leaks in Oxyacetylene Cutting Equipment**—Supplied with Oxygen and Acetylene from Pipe Lines (No. S-2A, 87 frames).

**Welding Series (10 filmstrips).**

**Setting Up Oxyacetylene Welding Equipment**—Supplied from Single Cylinder of Oxygen and Single Cylinder of Acetylene (No. W-1, 71 frames).

**Setting Up Oxyacetylene Welding Equipment**—Supplied with Oxygen and Acetylene from Pipe Lines (No. W-1A, 60 frames).

**Lighting and Adjusting the Welding Blowpipe**—Supplied from Single Cylinder of Oxygen and Single Cylinder of Acetylene (No. W-2, 51 frames).

**Lighting and Adjusting the Welding Blowpipe**—Supplied with Oxygen and Acetylene from Pipe Lines (No. W-2A, 52 frames).

**Principles of Oxyacetylene Welding** (No. W-3, 70 frames).

**Fundamentals of Oxyacetylene Fusion Welding of Steel, Part I**—Controlling the Molten Base Metal (No. W-4, 61 frames).

**Fundamentals of Oxyacetylene Fusion Welding of Steel, Part II**—Adding Welding Rod to Molten Puddle (No. W-5, 64 frames).

**Fundamentals of Oxyacetylene Fusion Welding of Steel, Part III**—Fusion Welding of Sheet Steel (No. W-6, 78 frames).

**Testing for and Fixing Leaks in Oxyacetylene Welding Equipment**—Supplied from Single Cylinder of Oxygen and Single Cylinder of Acetylene (No. S-1, 87 frames).

**Testing for and Fixing Leaks in Oxyacetylene Welding Equipment**—Supplied with Oxygen and Acetylene from Pipe Lines (No. S-1A, 87 frames).

**Safety Series (2 filmstrips).**

**Safe Handling of Oxygen and Acetylene Cylinders and Apparatus** (No. S-4, 91 frames).

**Fire Prevention and Other Precautions in Welding and Cutting** (No. S-4, 91 frames).

**Welding Series** (Castle, made by USOE, 5 filmstrips, si, manuals). Designed for use in conjunction with motion pictures of the same titles, but may be used independently, particularly for review purposes or as discussion guides. The strips review information presented in the motion pictures, using photographs and diagrams with question or problem captions, with some statements of important points. Individual titles are listed below with indications of subject matter reviewed.

**Manual Cutting to a Line—Freehand** (No. OE 186). Assembly of oxyacetylene cutting outfit; selecting proper cutting tip; adjusting oxygen and acetylene delivery pressures; adjusting preheating cutting flames; making 90-degree freehand cut; and disassembly of outfit.

**Manual Cutting a Bevel—Freehand** (No. OE 187). Selection of tip for bevel cutting; cleaning tip; adjusting oxygen and acetylene pressure for bevel cutting; cutting bevel with minimum drag; handling and operating cutting equipment safely.

**Manual Cutting a Shape—Freehand Guided** (No. OE 188). Making plywood template for cutting; making tip guide device; positioning template for cutting; using guide device; using circle-cutting device.



**The Guided Bend Test** (No. OE 189). Preparing groove-weld and fillet-weld test specimens for guided-bend test; making the test; causes of failure in bending.

**Oxyacetylene Welding Light Metal** (No. OE 190). Assembly of gas welding outfit; adjusting gas pressure and flame; making a butt weld and a T weld in light tubing.

## WOODWORKING AND CARPENTRY

**The Carpenter** (Filmette, 2 films, si, guides). A general survey of the type of work done by a carpenter, showing scenes in woodyards and in woodworking shops. They include many examples of types of joints, framework parts, placement of struts, joists, construction diagrams of roofs, gables, and rafters. The diagrams and models are suitable for woodworking-shop instruction. The strips may also interest groups in vocational guidance. The pictorial material is uncaptioned.

**Woodwork** (No. 56, 60 frames).

**Attics and Other Constructions** (No. 57, 67 frames).

**Safe Practices in Woodworking** (Jam Handy, 2 series, 22 filmstrips, si). Designed particularly for junior or senior high school woodworking classes and are suitable in subject matter and treatment for any beginning classes of this nature. Each filmstrip is divided into several lessons or instructional units, each followed by a review and a brief test. The lessons may be shown separately, and the entire strips may be utilized as general review on a complete unit of related material. The series stresses safety in woodworking operations, incorporating safety-measure instruction with information concerning techniques and procedures. In general, the visualization is good and organization of subject matter well done. There is a tendency to include more text than is readily legible on one frame, but this series is better in this respect than some of the early series from this producer. Individual titles are listed below with brief descriptions.

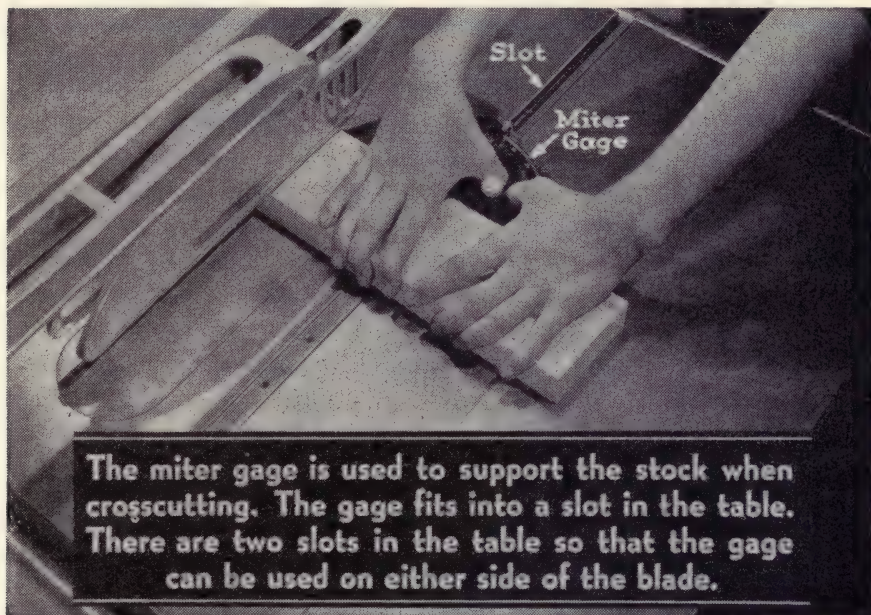
**Basic Shop Safety** (8 filmstrips). General safety subjects for the woodworking shop.

**Play Safe and Work Safely** (No. 1, 77 frames). Four lessons: (1) The safety program—general information re safety instruction in shop course. (2) Safe dress and shop clothing—principles to assist in avoiding accidents. (3) Good personal habits and shop hygiene. (4) Shop conduct, general instructions on working safely as part of a group.

**Maintaining a Safe Shop** (No. 2, 64 frames). Three lessons: (1) Keeping aisles, floors, and stairways safe. (2) Disposal of wiping cloths, cautions

about nails, disposal of scrap materials. (3) Safe methods of handling and storing materials; proper methods of moving heavy objects.

**Safety Inspection** (No. 3, 53 frames). Description of suggested duties for a student safety engineer, including selling safety, getting cooperation from others, making daily safety inspection, supervising students at work, supervising traffic within shop, checking housekeeping.



From filmstrip "The Circular Saw." (*Jam Handy.*)

**Training for Emergencies** (No. 4, 101 frames). Five lessons on handling of emergencies in the shop. (1) Emergency services—pointers on being ready for emergencies by knowing where first-aid kit, fire extinguisher, and alarm are kept, having emergency telephone numbers handy, and similar items. (2) Clothing caught in machine—detailed instructions on procedure. (3) Clothing on fire—includes use of fire blanket. (4) Fire in the school shop—group action. (5) Reporting a fire and using fire extinguisher.

**Treatment for Bleeding—Shock—Preventing Infection** (No. 5, 101 frames). Three lessons presenting first-aid treatment details. (1) Cuts, slivers, puncture wounds, and bruises, including methods of preventing infection. (2) Wounds with severe bleeding—stopping bleeding, preventing infection. (3) Fractures, including definition of fractures, methods of



preventing further damage and of making victim comfortable. Stresses need to prevent infection even with very slight wounds and necessity for calling medical aid for severe wounds and fractures.

**Aid for Injuries—Fainting—Burns** (No. 6, 94 frames). Five lessons.

(1) What to do if you are injured, reporting injuries, leaving injury alone if you don't know proper treatment, see doctor immediately if told to do so. (2) First aid for fainting. (3) First aid for small particles in the eye. (4) First aid for chemicals in the eye. (5) First aid for burns, scalds, and chemical burns.

**Eye Protection** (No. 7, 82 frames). Four lessons. (1) Introduction to goggles—types, when they should be worn, importance. (2) Selection, adjustment, care of chipper's goggles. (3) Welder's goggles—types, adjustment, care, and use. (4) Welder's helmets—types, care, adjustment, importance. Use of hand shield.

**Power Supply** (No. 8 120 frames). Safe practices dealing with power from four types of supply. Instructors can select the lessons pertaining to the types of supply in their own shops. Six lessons. Opens with introduction to power control. (1) Safe practices in starting and stopping machines wired separately from each other. (2) Starting and stopping machines controlled by hand-operated master switch. (3) Starting and stopping machines using motor controllers and emergency stop stations. (4) Starting and stopping machines driven by overhead belts. (5) Safe practices in shifting machine belts. (6) Safe practices in shifting overhead belts.

**Woodworking Tools and Machines** (14 filmstrips). Techniques in use of hand tools in setting up and operating power equipment, stressing safe practices.

**Hand Tools—Hammers—Saws** (No. 1, 67 frames). Four lessons. (1) Getting ready to work—getting yourself ready, selecting proper tools, carrying tools and arranging at workbench. (2) Safe use of coping saws. (3) Safe work with hand saws. (4) Safe work with hammers. Lessons include safety precautions, proper handling, and uses of tools.

**Planes—Bits—Knives—Chisels—Screw Drivers—Files** (No. 2, 72 frames). Six lessons. Safe use, proper selection, and handling of (1) smooth, jack, and jointer planes, (2) bits and drills, (3) chisels, gouges, and carving tools, (4) knives, (5) screw drivers, (6) files and wood rasps.

**Tool Grinder** (No. 3, 63 frames). Three lessons. (1) Introduction to tool grinder—uses, types, names, and functions of parts. (2) Safe practices for setting up a tool grinder. (3) Safe practices for using a tool grinder, includes procedures, operations, and precautions.

**Drill Press** (No. 4, 82 frames). Three lessons. (1) Introduction to drill press—uses, names, and functions of parts. (2) Safe practices for setting up a drill press. (3) Safe practices for using drill press, including procedures, operations, selection of drills and of speeds.

**Jig Saw** (No. 5, 96 frames). Three lessons. (1) Introduction to jig saw—names and function of parts and uses. (2) Safe practices in setting up a jig saw. (3) Using a jig saw—precautions, procedures, and operations.

**Band Saw** (No. 6, 89 frames). Three lessons. (1) Introduction to band saw—names and functions of parts and uses. (2) Safe practices for setting up a band saw. (3) Safe practices for using a band saw, including precautions, procedures, and operations.

**Disk Sander** (No. 7, 48 frames). Three lessons. (1) Introduction to disk sander—uses, kinds, names, and functions of parts. (2) Safe practices in setting up disk sander. (3) Safe practices for operating disk sander, including precautions, procedures, and operations.

**Belt Sander** (No. 8, 84 frames). Four lessons. (1) Introduction to belt sander—uses, names, and functions of parts. (2) Changing sander for horizontal position—procedures and precautions. (3) Safe practices for setting up belt sander. (4) Safe practices in belt sanding—procedures, operations, and precautions.

**Lathe—Parts—Spindle Turning** (No. 9, 86 frames). Three lessons. (1) Introduction to wood-turning lathe—uses, kinds, parts and their functions. (2) Safe practices for setting up lathe for spindle turning. (3) Safe practices in spindle turning—precautions, procedures, operations.

**Lathe: Faceplate Turning—Other Operations** (No. 10, 74 frames). Four lessons. (1) Safe practices in setting up lathe for faceplate turning. (2) Safe practices in faceplate turning—operations, procedures, and precautions. (3) Safe practices in sanding. (4) Safe practices in polishing and drilling.

**Planer** (No. 11, 75 frames). Three lessons. (1) Introduction to planes—parts and their function. (2) Safe practices in setting up planer. (3) Safe practices in using planer—precautions, operations, procedures.

**Jointer** (No. 12, 83 frames). Three lessons. (1) Introduction to jointer—names and functions of parts. (2) Safe practices in setting up jointer, and (3) in using jointer—procedures, operations, precautions.

**Circular Saw: Parts—Installing a Blade** (No. 13, 76 frames). Two lessons. (1) Introduction to circular saw—uses, kinds, names and functions of parts. (2) Selecting and installing blade—kinds of blades and their uses, procedures, and precautions in installing.



**Circular Saw: Setting-up—Operating** (No. 14, 64 frames). Two lessons.

(1) Safe practices in setting up circular saw. (2) Safe practices in using a circular saw—procedures, operations, precautions.

**The Roofer** (Filmette, No. 55, si, 55 frames, guide). Uncaptioned photographs and diagrams showing various types of work done by roofers, with details of various roofing operations and structures. Suitable for woodworking classes or beginning carpentry classes interested in roofing detail. Diagrams are clear and very legible. May also interest vocational guidance groups.

**Sawmill and Veneering** (Filmette, No. 63, si, 63 frames, guide provided). Uncaptioned photographs and diagrams: types of work done in the sawmill, details of work done by employees, examples of types of work including veneering, and examples of various types of veneer work. May also interest vocational guidance groups. Supplementary material for woodworking classes.

**Use of the Square** (Nasco, 3 filmstrips, si, double frame). Produced specifically for farm shop courses, but filmstrips provide good basic instruction on the use of the square in any woodworking or carpentry course. Diagrams with explanatory text on the same frame. The first strip is long but so organized that it may be shown in selected sequences as required by class needs. The other two strips are designed for use with the first strip as exercises in application of principles in using the square. It will probably be found that these filmstrips are most useful if shown in conjunction with actual shop practice. Individual titles with descriptions follow:

**The Use of the Square** (No. SF 120, 80 frames). Appearance of square; types of scales used. "Stepping-off" methods shown in detail. Use of square in marking off brace; general rules for such work; several problems in marking off braces presented for class solution. Device for checking. Short cuts in use of the square; use of guides. Terms and definition of roofs and roof members. Expressing pitch. Problems in laying off rafters—gable, combination, gambrel roofs—hip, valley, and jack rafters.

**Using the Square in Laying Out Hip, Valley and Jack Rafters** (No. SF. 121, 33 frames). Explanation and illustration of roof types using these types of rafters. Differences in laying out hip rafters. Common method of rafter assembly at ridge of hip roof; various marking and laying out problems with solutions. Problems in laying out hip rafters for student solution.

**Using the Square in Laying Out a Saw Horse** (No. SF 122, 16 frames). The problem of marking off the various cuts for a sawhorse 22 inches high, with lower end of legs spread sidewise 5 inches and edgewise 4 inches. Diagrams and text explain in detail the procedures and problems involved in marking off each cut. Method of assembly indicated.

**The Woodcarver: Ornaments, Carvings** (Filmette, No. 58, si, 51 frames, guide). General survey of woodcarver's work, showing many examples of types of ornaments and carvings, including views of carver at work. Uncaptioned. Supplementary material, showing one type of woodworking. May also interest vocational guidance groups and hobby clubs.

**Woodworking** (Castle, made by USOE, 7 groups, 20 filmstrips, si, manuals). Designed for use in conjunction with motion pictures of the same titles, but may be used independently, particularly as discussion guides or for review purposes. The filmstrips review information presented in the motion pictures, using photographs and diagrams with question or problem captions and some statements of important points. Individual titles are listed below with indications of subject matter reviewed.

**Wood Lathe** (5 filmstrips).

**Turning a Cylinder between Centers** (No. OE 313). How to choose and center stock, mount stock for turning between centers, select proper speed, select and use cutting tools, use parting tool to establish diameter and length, use skew chisel; sand turning work; safety factors involved.

**Turning Taper Work** (No. OE 314). How to center cylindrical woodstock for spindle turning, make clearance cuts, establish diameters of taper, turn single taper, establish diameters for turning two tapers from single piece of material, turn the tapers.

**Turning Work on Face Plate** (No. OE 315). Various types of faceplates. How to choose proper faceplate, attach stock to faceplate, true up the work, scribe for inside turning, use roundnose chisel and diamond-point chisel, smooth bottom of recess.

**Turning Work in a Chuck** (No. OE 316). How to mount work on faceplate, turn one face of work, make chuck for opposite face, fit finished face to chuck, turn second face.

**Face Turning a Collar** (No. OE 317). How to prepare faceplate chuck, attach work to faceplate chuck, turn a fillet, and taper turn a recess.

**Jointer** (4 filmstrips).

**Jointing Edges and End Grain 90 Degrees to a Face** (No. OE 302). How to set fence and infeed table to proper height, feed with the grain, joint end grain so as to prevent tearing, observe necessary safety precautions.

**Beveling, Stop Chamfering, and Tapering Square Stock** (No. OE 303). How to set fence for bevel cutting, adjust proper amount of cut, cut chamfer, set infeed and outfeed tables for stop chamfer, set stop-blocks, cut tapers, observe safety precautions.



**Face Planing Uneven Surfaces** (No. OE 304). How to surface wide stock on one side, use a pusher, make and use feather board, use backing block for facing thin stock.

**Jointing an Edge for Gluing—Installing Knives** (No. OE 305). How to determine when knives are dull, remove dull knives, install sharp knives on cutterhead and adjust for proper cutting, straighten crooked stock, join edges for gluing.

**Single Face Surfer** (1 filmstrip).

**Planing Rough Surfaces to Dimensions** (No. OE 301). How to adjust table for desired thickness, set feed rolls for proper speed, feed with the grain, surface short pieces and glued stock.

**Variety Saw** (4 filmstrips).

**Ripping and Crosscutting** (No. OE 306). How each working part of variety saw functions. How to check saw blades, set the fence, protect one's self on job, change saw blades, use cutoff gauge, use hinged block in crosscutting.

**Beveling, Mitering, Rabbeting, and Dadoing** (No. OE 307). How to cut a bevel with tilted fence, cut bevel with tilted blade, set miter gauge, use stopblock in mitering, set fence and blade for cutting rabbets, install and use dado head.

**Cutting Tenons and Segments** (No. OE 308). How to lay out and cut tenon, set up to make shoulder cuts, set up to make first and second check cuts, prepare jig to trim and miter segments, guide the jig, using sliding miter gauge.

**Cutting Cove Molding and a Core Box** (No. OE 311). How to select stock for cove molding, mark stock, cut and rip cove molding, set up and make progressive adjustments in oblique cutting, select proper blade for oblique cutting, cut a deep hollow.

**Band Saw** (2 filmstrips).

**Sawing with Jig and Changing Band** (No. OE 309). How to select proper band-saw blades for job, change blades, fold blades for storage, adjust saw guides, mark stock and cut to the mark, prepare jig, cut disks, using jig.

**Sawing a Reverse Curve and a Bevel Reverse Curve** (No. OE 310). How to select and lay out stock to avoid waste, reverse curves to contour lines, use table tilting gauge, saw a beveled, reverse curve, prepare template for newel post, saw a newel post having reverse curves.

**Sander** (1 filmstrip).

**Sanding Flat and Irregular Surfaces** (No. OE 312). How belt sander operates. How to prepare sanding belt, sand flat stock on belt sander, sand

curved molding, use and replace sandpaper on disk sander, use and replace sandpaper on spindle sander.

**Spindle Shaper** (3 filmstrips).

**Rabbeting and Shaping an Edge on Straight Stock** (No. OE 318).

Principle of shaper operation. How to set up machine for cutting rabbets, cut rabbets, set up machine to shape molding, shape a molding.

**Shaping after Template and Shaping Curved Edges** (No. OE 319).

How to make template for job, install knives in spindle, use template when smoothing squared edges, set up for shaping curved edge, shape a curved edge in more than one cut.

**Cutting Grooves with Circular Saw Blades** (No. OE 320). How to

set up machine to cut grooves, cut grooves in stiles and rails, cut grooves for splines, cut stop channels in mirror-frame members.

**Woodworkers Tools** (Visual Sciences, si, 36 frames). Simple line drawings of various tools used in woodworking. Includes among others: hand planes, measuring tools, layout tools, hand saws, levels and plumbs, knives, scrapers, spoke shaves, bit braces, screw drivers, chisels, gauges, mitre boxes, gauges, dowel jigs, nail set and awls, mallets, hammers, hatchets, compasses, dividers, wrecking bars, drills, rasps and files, calipers, grinders, sharpening stones, goggles, eyeshields, vises, bar clamps, finishing tools, and such items as bench duster, waste can, glass cutter, and pincers. Probably only value is in establishing familiarity with appearance of tools and their names.

For supplementary, illustrative, or related materials see also the following titles under Economic and Industrial Geography:

Lumber Production

Plywood Manufacture

Wood Structure

Wood Utilization



# Distributor Directory

- Allen—Allen Electric & Equipment Co., 2101-2117 N. Pitcher St., Kalamazoo, Mich.
- Allied Mills—Allied Mills, Inc., 717 Davis St., Fort Wayne 1, Ind.
- ACE—American Council on Education, 744 Jackson Place, Washington, D. C. In Canada, National.
- American Dental—American Dental Association, Order Department, Bureau of Public Relations, 222 E. Superior St., Chicago 11, Ill.
- AMA—American Medical Association, Bureau of Investigation, 535 Dearborn St., Chicago, Ill.
- Audivision—Audivision, Inc., 285 Madison Ave., New York 17.
- Better Vision—Better Vision Institute, 630 Fifth Ave., New York 20.
- BEVA—Business Education Visual Aids, 330 W. 72d St., New York 23.
- Brandon—Brandon Films, Inc., 1600 Broadway, New York 19.
- Carboloy—Carboloy Co., Inc., Box 237, Roosevelt Park P. O., Detroit 32.
- Case—Case, J. I. (see J. I. Case).
- Castle—Castle Films Division, United World Films, 30 Rockefeller Plaza, New York 20. In Canada, National and Benograph.
- Chicago Apparatus—Chicago Apparatus Company, 1735 N. Ashland Ave., Chicago 22, Ill.
- Coast Visual Education—Coast Visual Education Company, 143 W. Washington Blvd., Los Angeles 16.
- Curriculum—Curriculum Films, Inc., R.K.O. Building, New York 20. Distributed by Jam Handy, address below. In Canada, General.
- Dartnell—Dartnell Corporation, 4660 Ravenswood Ave., Chicago 40.
- Electrical World—Electrical World, 330 W. 42d St., New York 18.
- Employers Mutual—Employers Mutual Liability Insurance Company of Wisconsin, Employer's Mutual Fire Insurance Company, Wausau, Wis.
- EB Films—Encyclopaedia Britannica Films, Inc., 20 N. Wacker Drive, Chicago 6. In Canada, General.
- Eye Gate—Eye Gate House, Inc., 330 W. 42d St., New York 18.
- Federalist—Federalist Films, 391 Bleecker St., New York 14.
- Filmette—Filmette Company, 635 Riverside Drive, New York 31.
- Film Publishers—Film Publishers, Inc., 25 Broad St., New York 4. In Canada, National.

- Foley and Edmunds—Foley and Edmunds, Inc., 480 Lexington Ave., New York.
- Fruehauf—Fruehauf Trailer Company, Sales Promotion Department, Detroit 32.
- GE—General Electric Company, Visual Instruction Section, 1 River Road, Schenectady 5.
- Greek Gov. Office of Information—Greek Government Office of Information, 30 Rockefeller Plaza, New York 20.
- Gregg—Gregg Publishing Company, 270 Madison Ave., New York 16.
- Handy, Jam (see Jam Handy).
- Hawley-Lord—Hawley-Lord, Inc., 61 W. 56th St., New York 19. In Canada, National.
- Illinois Ed. Assoc.—Illinois Education Association, 100 E. Edwards St., Springfield, Ill.
- Illinois, University of (see University of Illinois).
- Informative—Informative Classroom Picture Publishers, 48 N. Division Ave., Grand Rapids, Mich. In Canada, National.
- International Police—International Association of Chiefs of Police, Safety Division, 1704 Judson Ave., Evanston, Ill.
- Jam Handy—Jam Handy Organization, 2900 East Grand Blvd., Detroit 11. 1775 Broadway, New York 19. In Canada, General.
- Case—J. I. Case Company, General Office, Racine, Wis.
- Kearney & Trecker—Kearney & Trecker Corporation, Educational Service, Milwaukee 14.
- Le Tourneau—Le Tourneau, R. G., Inc. (see R. G. Le Tourneau, Inc.).
- Linde Air Co.—Linde Air Products Company, 300 Madison Ave., New York 17.
- Long—Long FilmSlide Service, 944 Regal Road, Berkeley, Calif.
- McClure—McClure, O. J., Talking Pictures (see O. J. McClure Talking Pictures).
- Metropolitan Life—Metropolitan Life Insurance Company, Educational Department, 1 Madison Ave., New York 10.
- Mo. Pacific—Missouri Pacific Lines, Safety Department, St. Louis.
- Modern Talking—Modern Talking Picture Service, Inc., 9 Rockefeller Plaza, New York 20.
- NASCO—National Agricultural Supply Company, Fort Atkinson, Wis. (in the state of Illinois the majority of the filmstrips distributed by NASCO—those carrying an "SF" number—are available from the producer, Professor Henderson, Vocational Agriculture Service, College of Agriculture, University of Illinois, Urbana, Ill.).
- Nat'l Assoc. Leather Glove Manufacturers—National Association of Leather Glove Manufacturers, Inc., 53 S. Main St., Gloversville, N. Y.



- Nat'l Better Light Better Sight—National Better Light Better Sight Bureau, 420 Lexington Ave., New York 17.
- Nat'l Conservation—National Conservation Bureau, 60 John St., New York 7.
- Nat'l Fertilizer Assoc.—National Fertilizer Association, 616 Investment Building, Washington 5, D. C.
- Nat'l Highway Users—National Highway Users Conference, National Press Building, Washington 4, D. C.
- Nat'l Industrial Advertisers—National Industrial Advertisers Association, 100 E. Ohio St., Chicago 11.
- Nat'l Safety Council—National Safety Council, Inc., School and College Division, 20 N. Wacker Drive, Chicago 6.
- Nat'l Soc. for Prevention of Blindness—National Society for Prevention of Blindness, 1790 Broadway, New York 19.
- Nat'l TB Assoc.—National Tuberculosis Association, 1790 Broadway, New York 19 (apply state or local association).
- NY, NH & H—New York, New Haven and Hartford Railroad, the Department of Educational Service, 529 Industrial Trust Building, Providence 3.
- NY Univ.—New York University Film Library, 29 Washington Square, New York. In Canada, National.
- McClure—O. J. McClure Talking Pictures, 1115 Washington Blvd., Chicago 7.
- Photo & Sound Prod.—Photo & Sound Productions, 116 Natoma St., San Francisco.
- Photo Lab—Photo Lab, 3825 Georgia Ave., N.W., Washington 11, D. C. (for USDA filmstrips).
- Pictorial—Pictorial Films, 625 Madison Ave., New York 22. In Canada, Arrow.
- Pilgrim—Pilgrim Press, 14 Beacon St., Boston 8.
- Popular Science—Popular Science Publishing Company, 353 Fourth Ave., New York 10. In Canada, Arrow.
- Premier—Premier Vacuum Cleaner Division, General Electric Company, 1734 Ivanhoe Road, Cleveland 10.
- Public Roads Admin.—Public Roads Administration, Federal Works Agency, Washington, D.C.
- Ralston-Purina—Ralston-Purina Company, Educational Service Division, St. Louis.
- Le Tourneau—R. G. Le Tourneau, Inc., Longview, Tex.
- Row Peterson—Row, Peterson and Company, 1911 Ridge Ave., Evanston, Ill.
- Santa Fe—Atchison, Topeka & Santa Fe Railway System, Film Bureau, Public Relations Department, 302 Railway Exchange, 80 E. Jackson Blvd., Chicago 4.

Social Security—Social Security Board, Federal Security Agency, Washington, D.C.

Stillfilm—Stillfilm, Inc., 8443 Melrose Ave., Hollywood 46.

SVE—Society for Visual Education, 100 E. Ohio St., Chicago 11 (recent word from this producer indicates that a number of their filmstrips are currently undergoing revision). In Canada, Benograph.

Syndicate Store Merchandiser—Syndicate Store Merchandiser, Visual Training Division, 79 Madison Ave., New York 16.

Telefilm—Telefilm Corporation, 12 E. 44th St., New York 17.

United Air Lines—United Air Lines, Inc., School & College Service, 80 E. 42d St., New York 17; 23 E. Monroe St., Chicago; 6th and Olive Sts., Los Angeles; 400 Post St., San Francisco; 1225 Fourth Ave., Seattle (contact nearest office).

United Service to China—United Service to China, Inc., 1790 Broadway, New York 19.

Union of South Africa—Union of South Africa Information Office, 500 Fifth Ave., New York 18.

Univ. Ill.—University of Illinois, College of Agriculture, Vocational Agriculture Service, Urbana, Ill.

USDA—U.S. Department of Agriculture (see Photo Lab).

U.S. Public Health—U.S. Public Health Service, Bethesda Station, Washington 14, D.C. (apply state or local public health service).

Visual Sciences—Visual Sciences, Suffern, New York.

Vocational Guidance Films—Vocational Guidance Films, Inc., 2708 Beaver Ave., Des Moines 10. In Canada, General.

Westinghouse—Westinghouse Corporation, School Service, P. O. Box 1017, Pittsburgh 30.

Wright—Wright Aeronautical Corporation, Public Relations Department, Paterson 3.

Young America—Young America Films, 18 E. 41st St., New York. In Canada, National.

Zurich—Zurich Insurance Company, 135 S. La Salle St., Chicago.

## CANADA

The following concerns, referred to above under the names of the United States producers they represent in Canada, also distribute filmstrips produced outside of the United States which were not reviewed prior to the publication of this book.



For example, Associated Screen News Limited distributes the British produced filmstrips of Common Ground Limited, and Ryerson Film Service releases its own Canadian produced subjects. Some United States firms have released their filmstrips on a nonexclusive basis to more than one Canadian distributor.

The information in this book was provided by the National Film Society of Canada and the statements of the various distributors mentioned below:

**Arrow**—Arrow Films Limited, 1115 Bay St., Toronto, Ontario. Distributors of Pictorial, Popular Science. Also in Montreal.

**Benograph**—Benograph, a Division of Associated Screen News Limited, 1330 Sherbrooke St., Montreal, Quebec. Distributors of SVE and Castle. Also in Moncton, Toronto, Winnipeg, and Vancouver.

**General**—General Films, Limited, 1534 13th Ave., Regina, Saskatchewan. Distributors of EB Films, Jam Handy, Vocational Guidance Films, Curriculum. Also in Moncton, Montreal, Toronto, Winnipeg, and Vancouver.

**National**—The National Film Society of Canada, 172 Wellington St., Ottawa, Ontario. Distributors of ACE, Castle, Film Publishers, Hawley-Lord, Informative, NY Univ., Young America.

**Ryerson**—Ryerson Film Service, 299 Queen St. W., Toronto, Ontario.

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